BK	NBR	ANS	QUESTION	CHOICE A	CHOICE B	CHOICE C	CHOICE D	ILLUSTRATION
13	1	D	A bridge gage is normally used to determine turbine _____.	bearing oil clearance	diaphragm tip clearance	blade axial clearance	bearing wear	
13	2	B	Coast Guard Regulations (46 CFR) requires machinery driving the fuel oil transfer and fuel oil service pumps to be fitted with a remote means of stopping that machinery _____.	within the space concerned	outside of the space concerned	at the throttle station	within the fireroom	
13	3	D	If a ship is to be laid up for an indefinite period, the saltwater side of the main condenser should be _____.	left filled with saltwater with the sea valves closed	left filled with saltwater with the sea valves open	drained and refilled with saltwater after closing the sea valves	drained and dried out after closing the sea valves	
13	4	D	According to U.S. Coast Guard Regulations (46 CFR), which of the following pumps is required to have a pressure gage provided on the discharge side of the pump?	Fire pump	Boiler Feed pump	Fuel oil transfer pump	All of the above	
13	5	D	Assume that steam has formed in a boiler in which all of the steam stop valves are closed, and the water level is held constant. When there is an increase in the temperature of the steam and water in the boiler, which of the following effects will occur on the pressure and the specific volume of the steam?	The steam pressure and volume will remain constant.	The pressure will increase and the volume will remain constant.	The pressure will remain constant and the volume will increase.	The pressure will increase and the specific volume will decrease.	
13	6	B	When a mixture of steam and water in a boiler has reached the point at which NO further change in state can occur with the addition of heat, the mixture is considered to have reached its _____.	supercritical end point	critical end point	vaporization end point	saturation end point	
13	7	D	Which symbol shown in the illustration is used to identify a stop-check valve on a drawing?	A	B	C	D	SG-0014
13	8	D	If the water level cannot be seen in the lower part of the boiler gage glass, which of the following actions must be carried out immediately?	Increase the feedwater going to the boiler.	Check the DC heater water level.	Blowdown the boiler.	Secure the boiler fires.	
13	9	D	The item labeled "C" in the illustration, is the _____.	low pressure drain connection	high pressure drain connection	low pressure vent connection	low pressure steam supply connection	SG-0025
13	10	D	Fuel oil solenoid valves at the burner fronts should be of the manual reset type to _____.	permit the operator to secure each burner during a blackout	permit the operator to secure each burner after a blackout	prevent the furnace filling with oil during a power failure	prevent the furnace filling with oil after restoration of power	
13	11	C	Axial movement in a gear-type flexible coupling is provided for by _____.	each gear sliding on its shaft between retaining collars	the variable oil clearance in the quill shaft	external teeth on the floating member sliding between internal teeth on the shaft ring	adjusting the pitch of the teeth on the pinion and high speed gears	

13	12	B	A sectional (sinuous) header boiler is classified as which of the listed boiler types?	Bent tube	Straight tube	Express	D-type	
13	13	D	Which of the listed order of valves represents the proper installation of the main feedwater supply line to a marine propulsion boiler?	Regulator, stop, stop-check	Stop-check, stop, regulator	Stop, regulator, stop-check	Stop-check, regulator, stop	
13	14	B	Which of the following fuel oil characteristics establishes the danger point when transferring, pumping, and firing procedures are concerned?	Fire point	Flash point	Specific gravity	Viscosity	
13	15	C	When condenser tube ends are rolled into both tube sheets, the different rates of material expansion is compensated for by utilizing _____.	belled joints at both tube ends	threaded brass ferrules on the tube ends	expansion joints in the condenser shell	metallic packing pressed around the tube ends	
13	16	A	The Butterworth heater shown in the illustration receives steam at approximately _____.	130 psi	170 psi	205 psi	850 psi	SG-0005
13	17	B	The BTU value of fuel oil is determined by a/an _____.	open cup test	calorimeter	hydrometer	viscosimeter	
13	18	B	The variable capacity pressure atomizing fuel oil burner functions to _____.	maintain a constant fuel temperature	provide a wide range of combustion	provide a constant fuel return pressure	maintain smokeless fuel oil atomization	
13	19	D	As the pH of the boiler water approaches zero, the water becomes increasingly _____.	soft	alkaline	neutral	acidic	
13	20	B	A combustion control system diaphragm type air flow transmitter receives its high pressure signal from the boiler _____.	fan discharge	windbox	furnace	smoke box	
13	21	C	Concerning the classification of steam turbines, a cross compound designed unit _____.	consists of reaction stages and a dummy piston	consists of one Curtis stage and reaction blading	consists of a high pressure turbine, crossover pipe, and low pressure turbine	is made up of a varied assortment of impulse and reaction staging	
13	22	B	A sectional (sinuous) header boiler is classified as a/an _____.	bent tube type	straight tube type	"A" type	"D" type	
13	23	D	The required number of pounds of steam generated per hour to develop contract shaft horsepower and maintain the specified pressures and temperatures in the plant, when divided by the number of installed boilers, will give the _____.	overload capacity for each boiler	efficiency of each boiler	efficiency of each fireroom	full power capacity of each boiler	
13	24	B	Which type of energy is associated with the water of an operating boiler?	Chemical	Thermal	Mechanical	Specific	
13	25	D	Condensate return lines from tank heating coils are led to the _____.	atmospheric drain tank	main condenser	DC heater	contaminated drain system	
13	26	A	In which of the listed components is chemical energy converted to thermal energy with regards to boiler operation?	Furnace	Superheater	Steam drum	Economizer	

13	27	A	Coast Guard Regulations (46 CFR) regarding hydrostatic testing of main steam piping state that _____.	the hydrostatic test shall be applied from the boiler drum to the throttle valve	not less than fifty percent of the lagging shall be removed each time the hydrostatic test is applied	the hydrostatic test pressure must be maintained on the piping for a minimum of one hour	a pipe with a nominal size of six inches or more is not required to be hydrostatically tested	
13	28	A	If the water level in a steaming boiler is dropping rapidly and cannot be kept at the normal level by standard practices, you should _____.	secure the fires and then secure the steam stop	secure the steam stop and then secure the fires	blowdown the guage glass to find the true water level	speed up the feed pump to raise the water to normal	
13	29	C	The total heating surface of any steam generating unit is comprised of which of the listed surfaces?	Those parts of a boiler which are exposed on one side to only the water being heated and on the other side to the combustion gases, such as the economizer surfaces.	Those parts of a boiler which are exposed on one side to only the steam being heated and on the other side to the combustion gases, such as the superheater surfaces.	Those parts of a boiler which are exposed on one side to the water or steam being heated, and on the other side to the combustion gases.	Those parts of a boiler which are exposed on one side to only the water being heated and on the other side being directly exposed to the furnace flame.	
13	30	C	A combustion control system, diaphragm-type, air volume regulator receives its low pressure signal from the boiler _____.	windbox	casing	furnace	smoke pipe	
13	31	A	In a cross-compound main propulsion unit, the astern turbine is usually installed at the _____.	low pressure end of the low pressure turbine	high pressure end of the low pressure turbine	low pressure end of the high pressure turbine	high pressure end of the high pressure turbine	
13	32	A	The purpose of a 'peep' hole in the boiler casing is to _____.	examine the condition of the flame	check the operation of the soot blowers	check for excess smoke in the stack	examine the condition of the refractory cones	
13	33	B	Which of the listed characteristics is determined by calculating the amount of heat absorbed by the water and steam, then dividing by the available heat in the total pounds of fuel oil burned?	Fireroom efficiency	Boiler efficiency	Plant efficiency	Each of the above	
13	34	C	If a centrifugal main feed pump were operated at shutoff head with the recirculating line closed, which of the following conditions could occur?	A decreased water level in the DC heater.	An increased water level in the steam drum.	Flashing at the suction side of the pump.	Excessive diaphragm seal wear in the feedwater regulator.	
13	35	D	If a vessel is steaming at a steady rate, and the water level has dropped out of sight in the boiler gage glass, the FIRST corrective action should be to _____.	open the feedwater bypass regulator	blowdown the boiler guage glass	slow down the engines	cut out the fires	

13	36	A	Which of the stated pressure conditions identifies the boiler design pressure?	The pressure specified by the manufacturer as a criteria for boiler design.	A pressure lower than boiler operating pressure.	The same pressure as the boiler operating pressure at full power capacity.	The pressure at which a boiler is operated during overload conditions.	
13	37	B	Coast Guard Regulations require safety and relief valves for steam or air service to be provided with a substantial lifting device, capable of lifting the disc from its seat at what percentage of the set pressure?	50%	75%	110%	125%	
13	38	D	The process of breaking up fuel oil into fine particles to ensure good combustion is called _____.	settling	straining	pumping	atomization	
13	39	C	Depending upon the design of the boiler, the constant pressure maintained at the steam drum or the superheater outlet is known as the _____.	design pressure	overload pressure	operating pressure	output pressure	
13	40	C	In the event of a failure of the pneumatic control system, a multi-element feedwater regulator is designed to operate as a _____.	constant-pressure regulator	constant-volume feedwater regulator	manually controlled feedwater regulator	thermo-hydraulic feedwater regulator	
13	41	A	An efficient seal is obtained between the upper and lower halves of a turbine casing by _____.	precision metal-to-metal contact	copper gaskets	asbestos gaskets	flexible steel seal strips	
13	42	D	Which of the listed systems would be a potential source for the high pressure drain system?	Galley steam tables	Laundry steam pressing machines	Fuel oil tank heating coils	Steam systems operating in excess of 150 psi	
13	43	C	How is boiler water forced to circulate faster in accelerated natural circulation boilers, than in free natural circulation boilers?	Increasing the density of the water.	Installing a water circulating pump, such as a hydro-kineter.	Increasing the inclined angle of the generating tubes.	Increasing the surface area of the economizer exposed to the combustion gases.	
13	44	D	During initial starting of the standby turbine-driven boiler feed pump, which of the listed valves should remain closed?	Turbine exhaust valve	Turbine steam supply valve	Pump suction valve	Pump discharge check valve	
13	45	A	The temperature of the fuel oil received during bunkering operations is critical in determining the _____.	expansion space to leave in a tank	flash point at which the fuel will burn	temperature to which the fuel must be heated	rate at which the fuel can be pumped during transfer operations	
13	46	D	A natural circulation water-tube boiler, with one or more water drums, would be classified as a/an _____.	accelerated natural circulation boiler	controlled circulation boiler	header-type boiler	drum-type boiler	
13	47	C	The flash point of a residual fuel oil should be used to determine the highest temperature to which the oil may be heated _____.	for atomizing	for centrifuging	in a storage tank	in the recirculating line	

13	48	C	In addition to a nozzle, a fuel oil atomizer uses which of the listed parts?	Ignition electrode	Burner cone	Sprayer plate	Air cone	
13	49	C	The major heat loss in a marine boiler is from the heat _____.	used in the economizer and air heater	passing through the boiler casing	carried away by combustion gases	required to change water into steam	
13	50	C	That portion of the steam drum, containing a manhole for internal access to the drum, for the purpose of cleaning, inspecting, and carrying out repairs, is called the _____.	end plate	wrapper sheet	drumhead	tube sheet	
13	51	A	Carbon ring packing segments are secured in a turbogenerator gland by means of _____.	garter springs	centering rings	steam pressure	labyrinth rings	
13	52	C	Which of the following statements represents the major difference between a boiler drum and a header?	The temperatures at which they are operated.	The number of tubes permitted to enter a drum or header.	The size of each is significantly different.	The size of the tubes permitted to penetrate the drum or header.	
13	53	B	In a single furnace boiler, where is the steam typically cooled for use as auxiliary steam?	Superheater	Desuperheater	Condenser	Air ejector	
13	54	B	To prevent pulsations from developing in the feedwater lines the discharge side of a reciprocating feed pump is equipped with a/an _____.	feedwater regulator	air chamber	relief valve	reed valve	
13	55	B	When the boiler is operating at high firing rates, in addition to the generating tubes, which of the following tubes will also function as generating tubes?	Downcomers and water wall tubes	Superheater support, water screen, and water wall tubes	Water screen, superheater support, and economizer tubes	Water wall, water screen, and economizer tubes	
13	56	D	The main feed pump aboard ship can handle high temperature water without becoming vapor bound because the _____.	pump operates at a high discharge pressure	constant-pressure governor controls the discharge pressure	area above the impeller eye is vented to the main condenser	required net positive suction pressure is designed into the system	
13	57	C	The flash point of a residual fuel oil should be used to determine the _____.	highest temperature to which the oil may be heated for atomization	minimum temperature to which the oil should be heated for transferring	highest temperature to which the oil may be heated in a storage tank	minimum temperature to which the oil should be heated in the fuel oil heater	
13	58	D	In order for a maximum number of boiler generating and circulating tubes to be installed without weakening the tube sheet, which of the listed procedures should be carried out?	All rows of tubes should be bent at the same angle.	All rows of tubes should be installed horizontal to the drum.	Different rows of tubes should be bent to enter the drum at any convenient angle.	All tubes should be installed normal to the drum surfaces.	
13	59	D	The main feed pump discharge pressure is controlled by the admission of steam to the turbine. The admission of steam is normally regulated by a _____.	flyweight controlled regulating valve	nozzle arrangement	speed-limiting governor	constant-pressure governor	

13	60	D	As found in a basic pneumatic automatic combustion control system, the function of a standardizing relay is to _____.	provide a backup means for manual control of the system	control the boiler drum water level within acceptable limits regardless of the load	mechanically position valves or dampers in accordance with the amount of control pressure received	introduce a control for maintaining constant steam pressure regardless of boiler load	
13	61	A	Which of the following methods is used to counter axial thrust in a single flow reaction turbine?	A dummy piston and cylinder at the turbine inlet end	Pressure equalizing holes in the individual rotor wheels	Labyrinth packing	Carbon packing	
13	62	C	Corrosion due to electrolytic action in modern water-tube boilers is uncommon because _____.	boiler water is a strong electrolytic	alkalinity control treatment prevents electrolytic action	boiler components are generally constructed of similar metals	electrolytic action cannot occur at high pressure	
13	63	A	Which of the following statements describes those portions of the piping maintained under positive pressure when a pressure-closed feed system is in operation?	All condensate and feed piping except for a short section between the condenser and condensate pump.	Only the section between the condensate pump and deaerating feed tank.	Only the section between the deaerating feed tank and the boiler.	Only the section between the condenser and the condensate pump.	
13	64	A	Recirculation of the feedwater ensures a flow of water through the _____.	main feed pump	economizer	standby feed pump suction line	third stage heater	
13	65	B	Which of the listed components would be considered as the dividing point between the condensate system and the feedwater system?	Main condenser	Deaerating feed tank	Atmospheric drain tank	Boiler drum	
13	66	B	Which of the following statements describes what effect, if any, the change in temperature or pressure may have upon dissolved oxygen?	It slows the corrosive effect when both pressure and temperature are increased.	It speeds the corrosive effect with increased pressure and slows its corrosive effect with increased temperature.	It speeds the corrosive effect with lowered pressure and speeds its corrosive effect with increased temperature.	Temperature and pressure have no effect on the corrosive effect of disolved oxygen.	
13	67	D	When heating fuel oil used in main propulsion boilers aboard ship, the flash point may be exceeded only when _____.	it is necessary to transfer the fuel	the boiler is being fired under maximum load	the superheater temperature has been higher than normal	it is required for proper atomization	
13	68	C	The primary purpose of the sprayer plate in a mechanical atomizing oil burner is to _____.	completely mix air with the fuel	assist in mixing atomizing steam with the fuel	produce a fine, uniform fuel mist	prevent primary air mixing with the fuel	
13	69	B	The amount of sodium phosphate in treated boiler water can be measured by a/an _____.	alkalinity test	phosphate test	chloride test	sodium phosphorous test	

13	70	D	If a ship with an automated engine room system develops a 'high' boiler water level at half speed, the _____.	main feedwater stop valve will automatically close	main feed pump recirculating line will automatically open	surface blow valve will automatically open to lower the level	throttle will be automatically prevented from opening any further	
13	71	D	Which of the following types of main propulsion turbines is most likely to require a dummy piston or cylinder arrangement to counterbalance axial thrust?	Double flow impulse turbine	Multistage impulse turbine	Double flow reaction turbine	Single flow reaction turbine	
13	72	C	Longitudinal expansion of a boiler water drum is permitted by the _____.	tubes	casing	foundation	refractory	
13	73	B	Why is it necessary to have a relief valve protect the deaerating feed tank from internal pressure?	Because the tank receives auxiliary exhaust.	Because the tank receives high pressure drains.	Because the tank receives large amounts of water.	Because the tank receives small amounts of water.	
13	74	C	Which of the components listed prevents water from flowing back into the auxiliary exhaust line if the deaerating feed tank becomes flooded?	Exhaust piping	Pumps	Check valve	Reverse-acting relief valve	
13	75	D	Air removed from the main condenser is vented to the atmosphere through the _____.	vacuum breaker	vent condenser	atmospheric drain tank	aftercondenser	
13	76	C	Which of the pumps listed operates at constant speed and delivers water to the deaerating feed tank at a nearly constant pressure?	Main feed booster pump	Main feed pump	Main condensate pump	Main circulating pump	
13	77	A	Which characteristic of fuel oil is the most significant when determining the temperature to which the fuel oil must be heated for proper atomization?	Viscosity	Flash point	Pour point	Specific gravity	
13	78	A	The purpose of the relief valve in a fuel oil service system is to _____.	protect the service pump from high discharge pressure	regulate the atomizer oil pressure	control the oil pressure regulators	supply constant pressure to the burner combustion control valves	
13	79	B	Condensate pumps have distinctly noticeable characteristics and are recognized by their _____.	speed-limiting governors and closed impellers	large suction chambers and impeller eyes	multiple impellers and pump shaft positions	open impellers and power ends	
13	80	C	Which of the devices listed is used to keep overheated condensate from flowing to the deaerating feed tank?	Saltwater cooler	Freshwater cooler	Recirculating line to the main condenser	Recirculating line to the main feed pump	
13	81	A	The purpose of the reaction turbine dummy piston is to _____.	counteract axial thrust toward the turbine low pressure end	act in conjunction with gland seal steam to balance turbine thrust	assist in maintaining radial clearances	eliminate axial thrust caused by velocity increases in moving blades	

13	82	B	Which of the following statements represents the purpose of boiler sliding feet?	To ensure an airtight seal between the boiler inner and outer casings.	To accommodate the changing length of the water drum as it expands or contracts with temperature changes.	To compensate for deflection of the hull in way of the boiler supports.	To allow for unequal expansion between the wrapper and tube sheets.	
13	83	A	By which of the methods listed is the automatic recirculating valve in the main condenser recirculating line designed to be controlled?	Thermostat	Hand regulation	Escaping steam	Preset electric timing device	
13	84	A	The net positive suction head of a boiler centrifugal feed pump should be calculated over and above the _____.	feedwater vapor pressure	speed of the impeller	pump capacity in gpm	impeller ratio of the pump	
13	85	D	To combat galvanic corrosion, condensers utilizing copper-nickel waterboxes are usually fitted with _____.	bonding straps	iron or steel anodes	protective coatings	all of the above	
13	86	B	In the illustrated hydraulically operated turbine gland seal regulator, the exhaust dump valve is closed as a result of the piston being actuated by a/an_____.	bellows	spring	pilot valve	exhaust valve	SE-0019
13	87	C	Modern fuel oil temperature control devices are regulated to obtain a desired viscosity rather than a specific fuel oil temperature because _____.	residual fuel oils have the same viscosity characteristics regardless of where they are refined	the temperature of the fuel oil varies with the flow rate through the heater	the relationship between temperature and viscosity varies with different fuels	viscosity regulation eliminates the need for close control of the fuel/air ratio	
13	88	A	In the hydraulically operated turbine gland seal regulator, illustrated, the device used as the sensing unit is called a/an _____.	bellows	manifold	pilot valve	pivot rods and block	SE-0019
13	89	C	A test of boiler water for chloride content indicates the amount of _____.	suspended matter present	dissolved gases present	seawater contamination present	all of the above	
13	90	D	The boiler feedwater control valve varies the unity relationship between steam and water flow during periods of _____.	minimum boiler load	steady boiler load	overload operation	load change	
13	91	A	In a multistage reaction turbine, the dummy piston and cylinder function to _____.	reduce axial thrust	dynamic balance of the rotating rotor	eliminate the pressure drop across the blades	provide a means of measuring axial clearances	
13	92	B	A common type of air heater used in sectional header marine boilers is the _____.	direct contact type	gas tubular type	Harrison crossflow type	parallel flow type	
13	93	C	Gland sealing steam is used during steam turbine operation to prevent the loss of _____.	oil	air	vacuum	temperature	

13	94	D	Low pressure steam is used to keep air from leaking into turbine casing along the turbine shaft. For this purpose, which of the following steam systems is used?	Direct admission of 35 psi (241.3 kPa) auxiliary steam	Superheated steam system	Gland leakoff steam system	Gland sealing steam system	
13	95	C	In a closed feed and condensate system, the drain from the second stage air ejector returns directly to the _____.	auxiliary condenser	loop seal	atmospheric drain tank	deaerating feed tank	
13	96	B	Which of the water supplies listed below is typically used as a cooling medium for the gland exhaust condenser, intercondenser, and aftercondenser of an air ejector unit?	Seawater	Condensate	Potable water	Evaporator distillate	
13	97	C	The viscosity of a residual fuel oil is measured in Saybolt _____.	Milliliters Universal	Millimeters Universal	Seconds Furol	Minutes Universal	
13	98	A	Relief valves in the fuel oil service system discharge to either the service pump suction or the _____.	settling tanks	recirculating line	simplex fuel oil strainer	slop retention tank	
13	99	D	Testing boiler water for chloride content will indicate the amount of _____.	total alkalinity in the water	phosphates present in the water	methyl orange that should be added	disolved salts from sea contamination	
13	100	D	If the entire pneumatic control to a multi-element feedwater regulator fails, the feedwater valve is controlled by _____.	constant pump pressure regulator	remote manual control regulator	single-element feedwater regulator	local manual control	
13	101	A	One stage in an impulse turbine consists of a set of nozzles in which _____.	a single pressure drop occurs followed by one or more rows of moving blades	a single velocity drop occurs followed by one row of moving blades	steam expands and impinges on the row of reversing blades	velocity decreases and pressure increases followed by a row of moving blades	
13	102	C	One advantage of installing water wall tubes in a boiler furnace is to _____.	increase furnace size	reduce furnace temperature	decrease refractory maintenance	reduce combustion rates	
13	103	A	Which statement listed represents a vital function of the main condenser?	The recovery of feedwater for reuse.	Cooling of the exhaust steam from the auxiliary exhaust system before it enters the deaerating feed tank.	Storage of feedwater for immediate use in the boilers.	Condensing of the exhaust steam from the main feed turbine pumps.	
13	104	D	Which of the listed conditions aids in directing gland leakoff steam from the low pressure propulsion turbine to pass through the gland exhaust condenser?	Steam pressure from the low pressure turbine.	Steam pressure from the high pressure turbine.	Compressed air in the air pilot.	The use of a gland exhauster fan.	
13	105	D	Heat introduced to the condenser by exhausting steam is removed by the circulation of _____.	reserve feedwater	cold condensate	low pressure drains	seawater	

13	106	C	What unit, or factor creates most of the vacuum within a tight and adequately cooled main condenser once the main engine is in operation?	Main condensate pump	Main air ejector	Condensation of turbine exhaust steam	Counterflow of seawater over the surface of the tubes with the flow of exhaust steam in the tubes	
13	107	C	In what positions will the air-operated regulating valves, shown in the illustration, be in when the steam in the gland seal supply line is excessive?	Both valves are open.	Both valves are closed.	The excess steam unloading valve is open and the supply pressure control valve is shut.	The excess steam unloading valve is shut and the supply pressure control valve is open.	SE-0020
13	108	C	The primary objective of the auxiliary exhaust system is to supply steam to the _____.	main condenser	main feed pumps	deaerating feed tank	soot blowers	
13	109	A	You should blow down a gage glass periodically to _____.	remove any sediment from the glass	maintain the proper water level in the steam drum	provide water samples for the second assistant	test the feedwater stop-check valve	
13	110	C	Fine adjustments to a boiler combustion control system, to bring about near perfect combustion, should be made by manually adjusting the _____.	fuel oil back pressure	air volume regulators	fuel/air ratio knob	forced draft fan dampers	
13	111	D	An impulse-reaction turbine is characterized by which of the following arrangements?	Impulse diaphragms with reaction rotor blading.	Stationary nozzles with impulse rotor blading.	Reaction stages followed by velocity-compounded blading.	Velocity-compounded stages followed by reaction blading.	
13	112	D	The advantage of installing water wall tubes in a boiler furnace is to _____.	increase the flow of gases through the furnace	decrease the flow of gases through the furnace	increase heat transfer to the mud drum	permit higher combustion rates	
13	113	B	Steam drum water level indicators must be calibrated to compensate for density differences between the indicated drum water level, and the actual drum water level. If no compensation is made, the indicator will show a _____.	lower level than exists in the drum with the error becoming greater as the drum pressure decreases	lower level than exists in the drum with the error becoming greater as the drum pressure increases	higher level than exists in the drum with the error becoming greater as the drum pressure decreases	higher level than exists in the drum with the error becoming greater as the drum pressure increases	
13	114	D	When vapor is in contact with and remains at the same temperature as the liquid from which it was generated, the vapor and liquid are said to be in a/an _____.	latent contact	critical state	sensible contact	equilibrium contact	
13	115	A	The main condensate pump in a steam propulsion plant discharges directly to the _____.	air ejector intercondenser	main condenser hotwell	air ejector aftercondenser	DC heater vent condenser	
13	116	A	The set point pressure at which the first boiler safety valve is to lift is the _____.	maximum steam drum pressure	boiler overload capacity	operating design pressure	boiler full-power capacity	

13	117	A	The items labeled "D" in the illustration are the _____.	low pressure drain connections	high pressure drain connections	low pressure vent connections	low pressure steam supply connections	SG-0025
13	118	A	Which of the boiler components listed receives feedwater and serves as an area for the accumulation of saturated steam?	Steam drum	Headers	Water drum	Superheater headers	
13	119	D	Which of the listed boiler components is used to equalize the distribution of water to the generating tubes and provide an area for the accumulation of loose scale and other solid matter present in the boiler water?	Downcomer	Steam drum	Water drum only	Water drum and headers	
13	120	C	When firing a boiler in local manual control, an increase in boiler load must be accompanied by a/an _____.	increase in the fuel oil flow before an increase in the forced draft pressure	decrease in the forced draft air pressure before a decrease in the fuel oil flow	increase in the forced draft air pressure before an increase in the fuel oil flow	increase or a decrease in the fuel oil flow and forced draft air pressure simultaneously	
13	121	B	Design characteristics of a velocity-compounded impulse turbine include the utilization of _____.	one or more nozzles with one row of rotating blades	a single pressure stage with two or more velocity stages	a low velocity steam jet from a nozzle	two or more simple impulse stages	
13	122	C	Rows of tubes installed along the walls, floor, and roof of the furnace are called _____.	screen tubes	downcomers	water walls	water headers	
13	123	B	The connection labeled "B" in the illustration is used to _____.	maintain a vacuum in the shell of the feed water heater	provide a point of admission for the steam air heater drains	provide a point of admission for the L.P. bleed steam	drain condensate from the feed water heater to the main condenser	SG-0025
13	124	C	Which of the tube types listed can be considered to serve as downcomers at low firing rates, and as generating tubes at high firing rates on some boilers?	Water screen tubes	Water wall tubes	Superheater support tubes	Riser tubes	
13	125	B	Which of the following actions should be taken to reestablish a 'blown' air ejector loop seal?	Increase the condensate flow through the air ejector.	Momentarily close the valve in the loop seal line, then reopen slowly.	Shut off the steam to the second stage air ejector momentarily then open it again.	Decrease the steam pressure to the air ejector nozzles.	
13	126	D	The life of the furnace lining can be affected by _____.	the quality of installation	the service environment	the proper application of inspection criteria	all of the above	
13	127	A	In most marine boilers, the primary reason the first few rows of generating tubes, called screen or furnace row tubes, are made larger in diameter than the rest of the generating tubes is because _____.	they require more water flow since they are exposed to the greatest heat	they must screen the superheater from the direct radiant heat of the burners	they must act as downcomers to ensure proper circulation	their main function is to retard combustion gas flow for maximum heat transfer rates	

13	128	A	Boiler refractories previously baked out and fired are more sensitive to _____.	rapid cooling	sustained high furnace temperature	rapid heating	shock and vibration	
13	129	A	A unit of measure used to express the chloride content of boiler water is _____.	PPM	Micro-Farads	pH	Micro-Ohms	
13	130	D	Which of the following devices can be used to secure or hold furnace refractory in position?	Brick bolts	Boiler tubes	Anchor strips	All of the above	
13	131	B	When turbine rotor shafts extend through the casing, an external source of sealing steam is used in conjunction with labyrinth packing to _____.	maintain the rotor journal temperature	seal the casing during periods of low casing pressure	seal the casing during periods of high casing pressure	provide a constant flow to the gland leak off condenser	
13	132	A	A corbel in the furnace of a water-tube boiler is a fillet of plastic refractory used as a _____.	means of excluding slag from the joints at the furnace floor, walls, and corners	preformed burner arch section	foundation for refractory anchor bolts	set of gas baffles in the screen tubes	
13	133	C	Nichrome wire is used when patching boiler furnaces for _____.	anchoring plastic refractory only	reinforcing castable and plastic refractory	anchoring castable refractory only	anchoring castable and plastic refractory	
13	134	C	Which of the following statements is correct regarding the start-up operation of a noncondensing turbine-driven feed pump?	Keep the steam exhaust valve closed until steam is applied to ensure that the auxiliary exhaust line pressure does not drop.	Keep the pump casing vent valve closed until flow is established through the pump.	Open the pump suction valve prior to admitting steam to the turbine.	Secure all drains prior to admitting any steam to avoid damage to traps.	
13	135	A	In a main propulsion steam turbine installation, the condensate pump initially discharges to the _____.	air ejector condenser	deaerating feed tank	first stage heater	distillate tank	
13	136	A	Slagging of boiler furnaces is a slow progressive action which is accelerated by _____.	fuel oils having high ash content	low firing rates	prolonged feedwater contamination of fuel oil	burning diesel fuel	
13	137	A	Which constituent of fuel oil determines the specific heat?	Hydrocarbons	Oxygen	Nitrogen	Sulphur	
13	138	B	Which of the listed refractory materials is capable of providing structural stability?	Chrome castable	Firebrick	Insulating brick	Insulating block	
13	139	A	Boiler water samples should be circulated through a cooling coil prior to analysis because _____.	this keeps the water from flashing into steam as it is drawn from the higher pressure of the boiler to the lower pressure of the fireroom	it reduces the amount of suspended matter that frequently finds its way into the dead end lines	the cool sample has a higher conductivity measurement and the total dissolved solids in the water are easier to identify	the degree of acidity as measured on the pH recorder is amplified by cool water temperatures	

13	140	D	Which of the following statements represents the function of insulating brick?	Provides structural stability.	Acts as a gas-side layer at high temperature areas in D-type boilers.	Provides the first layer at the inside of inner casing.	Acts as backup insulation behind firebrick, plastic refractory, or castable refractory.	
13	141	A	Metallic packing rings are installed in turbine diaphragms to prevent _____.	interstage steam leakage along the shaft	air from entering the turbine casing	pressure buildup on both sides of the diaphragm	steam from escaping to the atmosphere	
13	142	B	A corbel in the furnace of a water-tube boiler is a _____.	preformed burner arch section	fillet of plastic refractory	formation of soot on furnace floor	type of refractory anchor bolt	
13	143	B	Which of the following statements represents the function of insulation block?	It is used to protect firebrick from maximum temperatures.	It is generally used as the first layer on the inside of inner casings.	It is used to provide structural stability.	Typically used as a gas-side layer at low temperature areas in D-type boilers.	
13	144	A	When operating with the auxiliary feed line, feedwater flow is controlled _____.	manually by throttling the auxiliary feed stop-check valve	automatically by the main feedwater regulator	manually by adjustment of the auxiliary feedwater regulator spring setting	automatically by the economizer bypass	
13	145	C	Serious tube leaks in the air ejector condenser assembly will cause _____.	clogged steam strainers	fouled nozzles	loss of vacuum	faulty steam pressure	
13	146	D	The primary purpose of refractory mortar is _____.	to seal brickwork joints	to seal tile installation joints	to provide cushioning of individual pieces against concentrated stresses	all of the above	
13	147	C	Which of the following refractory materials contains a hydraulic-setting binder and develops strength without needing to be heated in a manner similar to concrete?	Plastic fireclay	Plastic chrome ore	Castable fireclay	Refractory mortar	
13	148	A	Pumps normally used for fuel oil service are _____.	positive displacement rotary pumps	two-stage centrifugal pumps	explosion proof gear pumps	nonvented plunger pumps	
13	149	B	A sample of boiler water can be chemically tested by initially adding a few drops of a specific color indicator, then slowly titrating a standard solution into the water sample until the _____.	burette reading is zero and the sample color changes	sample undergoes a definite color change	desired pH has been attained in the sample	desired amount of standard solution has been added	
13	150	C	A major difference between the two element and the three element feedwater regulator control systems, is that a three element system will additionally measure and incorporate the _____.	drum water level to the feedwater regulator	steam flow to the feedwater regulator	feedwater flow as sensed variable	fuel oil flow to the feedwater regulator	

13	151	D	Labyrinth seals used to reduce leakage around a turbine shaft are constructed of _____.	spring bound carbon segments	braided asbestos covered core segments	staged rubber composition seal stripping	machined metallic packing strips or fins	
13	152	A	A corbel is used in a boiler furnace to _____.	protect the expansion joints	reduce gas turbulence	direct the flow of gases	contain the furnace heat	
13	153	A	Which of the following refractory materials is preferred for small repairs, particularly where standard size brick or tile cannot be used?	Castable fireclay	Plastic fireclay	Plastic chrome ore	Chrome castable	
13	154	B	Which system should be tested by raising the water level in the idle boiler?	Chemical feed	Auxiliary feed	Auxiliary fuel oil system	All of the above	
13	155	C	The cooling water flow from an air ejector intercondenser and aftercondenser is discharged directly into the _____.	main condenser hotwell	auxiliary condenser hotwell	condensate and feed system	atmospheric drain tank	
13	156	D	As a general rule, for proper results castable fireclay must be air cured for _____.	12 hours	18 hours	24 hours	48 hours or longer	
13	157	B	Which of the significant combustible elements of fuel oil is a major source of boiler corrosion?	Oxygen	Sulphur	Hydrogen	Carbon	
13	158	B	Which of the pumps listed is normally used in fuel oil service systems?	Two-stage centrifugal	Positive displacement rotary	Explosion proof gear	Nonvented plunger	
13	159	B	Phenolphthalein is used as an indicator to test boiler water for _____.	hardness	alkalinity	hydrazine	chloride content	
13	160	A	A ship is equipped with a two element feedwater regulating control system, and is required to respond to a 'stop' bell from full sea speed. With the shaft stopped, the automatic feedwater regulator will _____.	close down on the feedwater valve, due to the decrease in steam flow	open the feedwater valve wide, due to the effect of shrink	partially close down on the feedwater valve, due to the effect of swell	fully open the feedwater valve, due to the increase in steam flow	
13	161	D	Where are moisture shields located in a main propulsion steam turbine?	Around throttle valve stems	At the steam strainer inlet	At the inner stage diaphragms	After the last stage of the ahead rotor blading	
13	162	A	Boiler refractory firebrick is secured to the casing by _____.	slots in the brick engaging anchor bolts	high strength tensile fasteners	studding on the water wall tubes	fast drying plastic refractory mortar	
13	163	B	Which of the listed refractory materials will develop required strength only after being heated at a temperature of 1095°C (2000°F) or higher?	Castable fireclay	Plastic fireclay	Castable insulation	Chrome castable	
13	164	D	Makeup feedwater is brought into an operating closed feed system via the _____.	main feed pump	auxiliary feed pump	feed booster pump	condensor vacuum drag line	
13	165	D	Steam condensed in the air ejector intercondenser, drains to the _____.	atmospheric drain tank	aftercondenser drain tank	vent condenser drain tank	main condenser through the loop seal	
13	166	D	Due to of the curing characteristics of plastic refractory, its use should be avoided in _____.	high temperature areas	burner fronts	small repairs	low temperature areas	
13	167	D	Which of the significant combustible elements of fuel oil is a major source of air pollution?	Hydrogen	Nitrogen	Vanadium	Sulphur	

13	168	C	What is indicated by the code number 32Y20 stamped on a burner sprayer plate?	Sprayer plate orifice area is 0.32 square inch.	Sprayer plate requires a size 20 tip.	Sprayer plate orifice was made with a size 32 drill.	Sprayer plate requires a minimum of 20 psi fuel pressure.	
13	169	B	Phenolphthalein indicator is used in the boiler water test for _____.	dissolved oxygen	alkalinity	chloride content	hardness	
13	170	C	Which of the listed refractory materials can be used as a substitute for insulating brick and insulating block in certain boiler walls construction?	Insulating cement	Castable fireclay	Castable insulation	None of the above	
13	171	A	Which of the following statements represents the function the nozzle assembly performs in an impulse turbine?	Converts the steam's thermal energy into kinetic energy by increasing its velocity and directing it against the rotor blades.	Provides an area where the steam is prevented from expanding prior to being directed against the rotor blades.	Increases the velocity of the steam without a pressure drop across the diaphragm.	Converts the potential energy of steam into thermal energy by increasing its velocity and directing it against the turbine blades.	
13	172	A	Boiler refractory anchor bolts are secured to the casing by _____.	hooked ends inserted into pads welded to the casing	slots in the firebrick	high strength tensile fasteners	furnace mortar	
13	173	D	Which of the listed refractory materials is a suitable substitute for insulating block only?	Insulating brick	Insulating cement	Castable insulation	None of the above	
13	174	B	Which of the listed conditions will always result in dissolved oxygen being carried over from the main condenser?	Priming in the boiler.	Taking on makeup feed.	Dumping auxiliary exhaust steam to the main condenser.	Excessive DC heater temperature.	
13	175	B	The loop seal connected to the main condenser returns the drains from the _____.	vent condenser	intercondenser	aftercondenser	all of the above	
13	176	C	Which of the listed refractory materials would NOT be suitable for use in a wall previously provided with 2-inch thick insulation block, or in the construction of floors, or as a gas-side layer?	Firebrick	Insulating brick	Castable insulation	All of the above	
13	177	C	A desirable property of boiler fuel oil is _____.	low carbon content per pound of fuel	high sulphur content for complete combustion	high BTU content per pound of fuel	low residual acid after combustion	
13	178	A	Which of the following statements represents the advantage of castable insulation over either insulating brick or insulating block installations?	The speed and economy of installation.	Its resistance to high temperatures.	Its high comparative strength.	Its comparative greater insulating value.	
13	179	A	A sodium sulfite test is performed on a boiler water sample to determine if _____.	there is any excess sulfite present	the pH of the boiler water is within the prescribed limits	the dissolved oxygen in the boiler water is within tolerable limits	the hardness factor is maintained as close to zero as possible	

13	180	A	Which of the listed refractory materials is composed of wool fibers and clay binders?	Insulating cement	Castable fireclay	Chrome castable ore	All of the above	
13	181	C	Nozzle diaphragms are installed in pressure-compounded impulse turbines to _____.	support moving blades	support shrouding	hold the nozzles of the stage and admit steam to moving blades	eliminate blade and nozzle losses	
13	182	C	When heated, brickwork in a boiler is kept from buckling by the installation of _____.	anchor bolts	sliding saddles	expansion joints	insulating blocks	
13	183	D	The primary purpose of insulating cement is _____.	to seal joints in brickwork	to anchor insulating block to the casing	to cushion the pieces against concentrated stresses	to fill voids in the insulation block layers at missing corners or at cutouts for anchor devices	
13	184	B	Under EMERGENCY operating conditions, the proper valve positions for controlling feedwater to the boiler should be the _____.	auxiliary stop-check valve fully open and the auxiliary stop valve used to regulate the amount of flow	auxiliary stop valve fully open and the auxiliary stop-check valve used to regulate the amount of flow	auxiliary stop and stop-check valves fully open and the feed pump speed used to regulate the amount of flow	auxiliary stop-check valve fully open and the auxiliary stop valve regulated by the feedwater regulator	
13	185	D	Which statement is true concerning two-stage air ejector assemblies?	Air is removed from the condensate as it passes through the tubes.	In the aftercondenser the air ejector motivating steam is condensed and returned to the main condenser via the loop seal.	The first stage air ejector takes suction on the second stage to increase vacuum.	The steam/air mixture from the main condenser is discharged by the first stage jet pump to the intercondenser.	
13	186	B	Which of the following refractory materials can provide a straight backing surface for insulation block where minor casing warp has occurred?	Castable insulation	Insulating cement	Castable fireclay	Chrome castable	
13	187	D	The presence of sulphur in fuel oil will most likely cause _____.	a decrease in the ability of the oil to be properly atomized	an excessive heat content per unit volume	heavy slag formation on the refractory	corrosion on the firesides of the boiler	
13	188	B	Which atomizing sprayer plate has the largest capacity?	4309	2909	2 PCRS 3509	3009	
13	189	C	Which of the listed refractory materials may be used with other machinery insulation arrangements outside of the boiler?	Castable fireclay	Refractory mortar	Insulating cement	Castable insulation	
13	190	A	Brick bolts, tile bolts, and pennant anchors are attached to the inner casing by _____.	retaining clips	fillet welds	tack welds	All of the above are correct.	
13	191	C	A pressure-velocity compounded impulse turbine consists of _____.	velocity compounding with reaction pressure compounding	several rows of moving blades attached to diaphragms	two or more stages of velocity compounding	two or more rows of nozzles in which no pressure drop exists	

13	192	A	Which of the listed refractory materials can be used in an area directly exposed to the highest heat in the furnace?	Firebrick	Insulating brick	Insulating block	Baffle mix	
13	193	D	Which of the following statements represents the primary function of handholes used on a boiler?	To allow access into the steam and water drum.	To allow access for cleaning in the stack.	To provide access for cleaning out the firebox.	To allow access into the headers.	
13	194	A	If manual control of the water level in a steaming boiler is required, the proper method of control is with the auxilary feed _____.	stop-check valve	stop valve	pump speed control	pump pressure control	
13	195	C	In the condensate system, the automatic recirculating valve can be actuated by the _____.	DC heater water level	superheater steam flow	condensate temperature	condensate pump discharge pressure	
13	196	B	The primary source of steam to the auxiliary exhaust system is typically supplied directly from _____.	the main engine LP bleed	turbine driven and reciprocating steam pumps	the turbine gland exhaust system	all of the above	
13	197	B	The most harmful slag forming compounds found in fuel oils are _____.	iron and sulphur	vanadium and sodium	potassium and nickel	calcium and silica	
13	198	A	Which group of numbers would indicate the largest fuel capacity for a sprayer plate in a mechanical fuel oil atomizer?	2909	3509	43709	3 PCRS 4309	
13	199	B	Normally a boiler water sample should be taken _____.	after the boiler has been blown down	before the boiler has been blown down or chemicals added	when the boiler has been refilled with makeup	from the highest point in the feed system	
13	200	C	The contaminated drain system normally receives drains that may be exposed to _____.	salt water contamination	spoiled food contamination	oil contamination	water contamination due to boiler treatment	
13	201	D	Which of the devices listed is found on an LP main propulsion steam turbine casing?	Duplex set of relief valves	Sliding beam	HP turbine bypass valve	Sentinel valve	
13	202	B	In a steam propulsion plant, the primary source of auxiliary exhaust steam is from the _____.	main condenser	main feed pump	distilling plant	air heaters	
13	203	D	Auxiliary steam at full operating pressure is supplied directly from the boiler to the _____.	turbogenerator	main air ejectors	distilling plant	soot blowers	
13	204	A	Which of the operating principles listed would apply to a single-element, thermo-hydraulic, feedwater regulator?	A failure of the regulator pressure actuating system closes the valve.	The regulator maintains a constant water level throughout the boiler load range.	The cooling fins on the generator prevent the formation of steam in the closed system.	The pressure in the inner tube acts upon the bellows of the regulator.	
13	205	C	Main condensate recirculating systems are primarily intended to _____.	prevent excessive overheating of the condensate pumps	balance and control condensate temperatures at full load	provide adequate cooling water for the air ejector condensers	vent accumulated vapors from the condensate pump discharge	

13	206	B	Which of the casualties listed is apt to occur immediately after a high water casualty?	Massive tube failure	Water carryover to the turbines	Excessive steam pressure	Excessive superheater temperature	
13	207	D	Heavy slagging and high temperature corrosion of boiler tubes can result from using a fuel oil with high amounts of _____.	ash	sodium chloride salts	vanadium salts	all of the above	
13	208	B	Which precaution should be observe to prevent damage to the fuel oil service pump when warming up the fuel service system?	Strip all water from the fuel oil settlers.	Close the recirculating valve when the proper atomization temperature is reached.	Heat the fuel oil in the settlers to the atomization temperature.	Bypass the fuel oil meter so that recirculating oil does not register.	
13	209	C	The last two digits stamped on a fuel oil atomizer sprayer plate represents the cross-sectional area ratios of the tangential slots and orifice. This ratio determines the _____.	density of the oil spray	degree of atomization	angle of the cone	capacity of the atomizer	
13	210	B	In a water-tube boiler, circulation is caused by the difference in the _____.	area and length of the water-tubes	densities within the circulating water	heights of the boiler drum	angle of inclination of the tubes	
13	211	C	Shrouding on impulse turbine blading is held in place by _____.	seal welding	circumferential dovetails	peening the tenons	locking keys	
13	212	B	The means of circulation commonly found in water-tube boilers is _____.	compound	accelerated	cross-compound	integral	
13	213	A	High pressure and low pressure drain systems are part of the _____.	fresh water drain system	auxiliary turbine drain system	contaminated drain system	boiler drain system	
13	214	C	Which of the following statements is true concerning the operation of a boiler thermo-hydraulic feedwater regulator?	A failure in the regulator pressure actuating system opens the feed valve wide.	The regulator maintains constant water level throughout all boiler load ranges.	The inner tube of the generator is open to the steam and water in the steam drum.	The outer tube of the generator transfers heat to the inner tube of the closed system.	
13	215	A	The DC Heater functions to _____.	store, heat, and deaerate feedwater	chemically treat feedwater to remove carbonic gas	ensure recirculation in the feedwater system	remove the major amount of noncondensable gases from the main condenser	
13	216	C	The high pressure steam drain system is normally collected by the _____.	atmospheric drain tank	contaminated drain inspection tank	deaerating feedwater heater	main condenser	
13	217	D	A lower than normal boiler stack gas temperature usually indicates _____.	dirty firesides	dirty watersides	fuel high sulfur content	incomplete combustion	
13	218	A	The number '29' on a sprayer plate marked '2909' indicates the _____.	orifice size	cross-sectional area ratio	whirling chamber size	slot cross-sectional area	
13	219	A	Eight (8) ounces (0.22 kg) of oxygen, dissolved in 500,000 pounds (226.58 t) of water, is a concentration of _____.	1.0 ppm	4.0 ppm	8.0 ppm	16.0 ppm	

13	220	B	The steam separator as used in conjunction with a steam whistle normally drains to which of the listed drain systems?	Low pressure	High pressure	Main turbine	Contaminated	
13	221	C	Allowance for axial expansion of the steam turbine due to temperature changes is provided for by the use of _____.	casing flexible joints	rotor position indicators	a deep flexible I beam support	pivoted-shoe type thrust bearings	
13	222	A	Which of the following statements concerning boiler steam drum surface blow piping is correct?	Usually the surface blow pipe is perforated with holes along its top surface; however, when a scum pan is also employed, the holes are located along the bottom of the pipe surface.	The centerline of the pipe is normally situated at a distance from the bottom of the steam drum equal to approximately one fourth the diameter of the drum.	To ensure adequate blowdown, the aggregate cross sectional area of these perforated holes must be equal to approximately twice the cross sectional area of the pipe.	All of the above.	
13	223	C	Clean low pressure steam drains are collected in the _____.	deaerating feedwater heater	contaminated drain inspection tank	atmospheric drain tank	main condenser hotwell	
13	224	A	In a single-element feedwater regulator, the amount of valve opening and closing is controlled by the _____.	water level in the drum	steam pressure in the drum	steam flow from the boiler	feedwater flow to the boiler	
13	225	B	Which statement is true concerning drain inspection tanks?	Inspection tanks collect all HP drains.	Inspection tanks provide for a visual examination of condensate which could be oil contaminated.	They are discharged to the condensate system just forward of the feed pump.	They collect condensate from the cargo tank heating coils only.	
13	226	D	From which of the areas listed are condensate drains normally collected and returned to the low pressure drain system?	Steam whistle separator/trap	Each main feed pump steam supply line	Steam systems operating in excess of 150 psi	Main and auxiliary air ejector aftercondensers	
13	227	C	Economy and efficiency in the operation of a marine boiler have traditionally been characterized by _____.	a clear stack (invisible stack gases)	maintaining the fuel oil temperature as high as possible	a light brown haze from the stack	a slight wisp of white smoke from the stack	
13	228	B	When warming up a fuel oil service system, you should open the steam supply to the fuel oil heaters _____.	before you start the fuel oil service pump	after you start the fuel oil service pump	only if the settlers are incapable of heating the oil	before you open the recirculating valve	
13	229	C	A dissolved oxygen concentration of 8.0 ppm represents _____.	8 lbs of oxygen dissolved in 1,000,000 tons of water	8 tons of oxygen dissolved in 1,000,000 pounds of water	8 ounces of oxygen dissolved in 1,000,000 ounces of water	80 ounces of oxygen dissolved in 100,000 ounces of water	

13	230	B	The level in the atmospheric drain tank is normally maintained by the use of a/an _____.	overflow to the bilges	float-type regulator	vacuum drag to the air ejector condenser	overflow to a distillate tank	
13	231	C	The forces of expansion developed within a propulsion turbine casing are accommodated by _____.	expansion bolts at the base of the steam line	an expansion loop in the exhaust line	supporting the forward end on a deep flexible I-beam	corrugations in the steam chest	
13	232	C	In a boiler equipped with a convection type superheater, the superheater tubes are located _____.	in the path of the radiant heat of combustion	between the downtake nipple and circulator tube	in a position screened from the furnace	between the economizer and generating tubes	
13	233	D	The primary function of the contaminated drain inspection tank is to _____.	store contaminated drains	separate the oil and water by using a series of filters and baffles	only cool down the contaminated drains	serve as a means for visually examining the drains	
13	234	B	Single-element automatic feedwater regulators are controlled by the _____.	temperature in the steam drum	water level in the steam drum	pressure in the steam drum	feedwater flow to steam drum	
13	235	D	The DC heater functions to _____.	remove air from feedwater	heat feedwater	store feedwater	all of the above	
13	236	B	If live steam is supplied directly to the tank heating coils, the collected drains in the 'clean' section of the contaminated drain inspection tank are removed directly to the _____.	main and/or auxiliary condenser	atmospheric drain tank	deaerating feedwater heater	makeup feedwater tank	
13	237	B	A light brown haze issuing from the boiler smoke stack generally indicates _____.	dirty fuel atomizers	good fuel combustion	too much fuel pressure	a high firing rate	
13	238	B	The complete unit housing the burner, air scoop, air doors and bladed cone is correctly called the _____.	burner assembly	register assembly	atomizer assembly	air duct assembly	
13	239	B	If it should become necessary to abandon a compartment because of the danger of a large steam leak on a boiler, which of the following actions represents the best avenue of escape?	Escape through another compartment on a higher level.	Escape through another compartment on a lower level.	Escape by way of a fireroom ladder to the outer deck.	Use fireroom elevator to an upper deck.	
13	240	C	The percentage by weight of steam in a mixture of steam and water is called the _____.	moisture percentage	moisture quality	quality of steam	heat effectiveness	
13	241	D	The correct radial clearances between the rotor and the casing in a propulsion turbine are maintained by the turbine _____.	interstage packing	thrust bearing	diaphragms	journal bearings	
13	242	A	In a boiler equipped with a convection type superheater, the superheater tubes are located _____.	in a position screened from the furnace	in the direct path of radiant heat flow	in a separately fired convection furnace	on the fireside of the screen tubes	
13	243	A	Excessive water flow beyond the design limits of a feedwater heater, will be indicated by a/an _____.	increase in the pressure drop between the water inlet and outlet	decrease in the pressure drop between the water inlet and outlet	excessive gas liberation from the waterside vents	high steam temperature at the heater outlet	
13	244	B	A two-element boiler feedwater regulator is controlled by _____.	steam flow and feedwater flow	steam flow and drum water level	drum water level and feedwater flow	drum water level and drum pressure	

13	245	B	A high water level in a deaerating feed heater will cause the automatic dump valve to drain condensate to the _____.	atmospheric drain tank	reserve feed tank	auxiliary condenser	main condenser	
13	246	C	As steam accomplishes work in an engine or turbine, the pressure of the steam is reduced because it _____.	diminishes in volume	becomes saturated again	expands in volume	becomes superheated again	
13	247	A	The greatest single overall steam plant and boiler efficiency loss results from _____.	heat lost in the main condenser	poor heat transfer in feedwater heaters	mechanical losses in the atomization process	permanent poor combustion in the boiler	
13	248	D	The most serious fireside burning of the boiler superheater tubes is the result of _____.	combustion gases impinging on the tubes	fuel droplets striking the hot tubes	carbon steel tubes being heated above 750°F	the tubes becoming steam bound or dry	
13	249	B	If the theoretical quantity of dry air required to burn one pound of fuel oil is 13.75 pounds, what weight of air will be necessary to burn one pound of fuel to operate a boiler at 10% excess air?	14.44 pounds	15.13 pounds	15.81 pounds	16.50 pounds	
13	250	B	As steam accomplishes work in an engine or turbine, it expands and _____.	increases in superheat	decreases in superheat	decreases in volume	decreases in moisture content	
13	252	B	The purpose of the division plates installed in boiler superheater headers is to _____.	limit the maximum temperature rise of the superheater outlet to 15°F	ensure proper steam flow, thus preventing 'short circuiting' of superheater loops	provide a means of controlling steam passage in response to throttle demands	all of the above	
13	253	C	The connection labeled "C" in the illustration, is used to _____.	maintain a vacuum in the shell of the feed water heater	provide a point of admission for the steam air heater drains	provide a point of admission for the L.P. bleed steam	drain condensate from the feed water heater to the main condenser	SG-0025
13	254	D	A two-element feedwater regulator responds directly to changes in _____.	feedwater flow to the boiler	feedwater pump discharge pressure	DC heater water level	steam flow from the boiler	
13	255	D	The DC heater automatic level dump valve is used to _____.	divert the flow of condensate from the first stage heater to the vent condenser	maintain a proper condensate level in the condenser hotwell	recirculate condensate to the atmospheric drain tank	drain excess feedwater to the distilled water tank	
13	256	A	Which of the following conditions in a water-tube boiler generating tube could cause tube failure, even if the water gage glass shows the proper level?	Film boiling	low dissolved oxygen content	Decreased superheat	A film of soot	
13	257	B	Efficient combustion in a boiler is indicated by a _____.	white haze	brown haze	yellow haze	black haze	

13	258	B	When seated, the disc of a safety valve has an area of 0.75 square inches (1.9 sq cm). When the valve lifts the area is increased by 10%. If the valve lifts at 300 psig (2170 kPa), at approximately what pressure will the valve reseat?	262 psig (1907 kPa)	273 psig (1983 kPa)	284 psig (2059 kPa)	295 psig (2135 kPa)	
13	259	D	When a boiler water test indicates a pH value of 6, you should _____.	check the DC heater for possible malfunction	begin a continuous boiler blowdown	chemically treat to lower the pH to normal level	chemically treat to raise the pH to normal level	
13	262	B	In a D-type boiler, which of the tubes listed would be located in the generating tube bank?	Water walls	Superheater support tubes	Downcomer tubes	Recirculating tubes	
13	263	A	If water hammer develops while opening the valve in a steam line, which of the following actions should be taken?	Shut the steam valve at once, open the drain valves until all moisture is drained, shut the drain line valves, and slowly open the steam valve again.	Continue to fully open the steam valve as the drain line valves are opened until all moisture is drained, shut the drain line valves.	Stop opening the steam valve, open the drain line valves, resume opening the steam valve slowly, and shut the drain line valves after the steam valve is open fully.	Increase the speed of opening the steam valve to rapidly heat the line to stop the water hammer.	
13	264	A	Two-element feedwater regulators operate by sensing _____.	boiler water level and steam flow	boiler water level and steam pressure	boiler water level and feedwater flow	feedwater flow and steam pressure	
13	265	A	High pressure steam drains are normally discharged to the _____.	DC heater	atmospheric drain line	reserve feed tank	drain and inspection tank	
13	266	A	Identify the system shown in the illustration.	Bleed steam	Auxiliary steam	High pressure drains	Auxiliary condensate	SG-0024
13	267	C	The major heat loss in an oil fired boiler is the heat _____.	used in the economizer and air heater	passing through the boiler casing	going up the stack	required to change water into steam	
13	268	C	Which of the systems or components shown in the illustration, are supplied by auxiliary exhaust steam?	Air ejectors	Intermediate pressure bleed steam system	Boiler air heaters	Low pressure bleed steam system	SG-0024
13	269	B	When securing a boiler, the burner registers are to be left open for a few minutes to _____.	cool the furnace	purge the furnace	cool the uptakes	kill steam generation	
13	270	B	The auxiliary exhaust system shown in the illustration can be supplied by steam from the _____.	fuel oil heaters	IP bleed system	main steam system	distilling plant	SG-0024
13	271	C	In modern reaction turbines, thin tipping is a procedure designed to _____.	allow for axial expansion	increase blade strength and rigidity	reduce tip leakage	maintain radial clearances	
13	272	A	Boiler screen tubes are used to protect which of the listed components from high furnace temperature?	Superheater	Refractory	Wall tubes	Steam drum	

13	273	A	The best conductor of heat in a marine boiler is _____.	steel	water	steam	brick	
13	274	A	A two-element feedwater regulator reacts to changes in the steam drum water level and the _____.	steam flow from the boiler	main feed pump speed	water flow to the boiler	signal from the flame scanner	
13	275	B	High pressure steam drains, such as those coming from the superheater, main steam line, and throttle block, are generally discharged to the _____.	main condenser	deaerating feed tank	vent condenser	atmospheric drain tank	
13	276	C	Damage to deck machinery from water hammer developing in the steam lines can be prevented by _____.	installing a steam strainer in all exhaust lines	opening machinery throttle valves rapidly	draining the steam piping before operating any machinery	ensuring that all drain lines are properly insulated	
13	277	A	If the theoretical quantity of dry air required to burn one pound of fuel oil is 13.75 pounds, what is the weight of air per pound of fuel when operating a boiler at 5% excess air?	14.44 pounds	15.13 pounds	15.81 pounds	16.50 pounds	
13	278	C	The boiler fuel oil system 'hot' strainers are also known as _____.	coarse strainers	magnetic strainers	discharge strainers	cestus strainers	
13	279	A	A practical ceiling on boiler efficiency with regard to heat absorption is the requirement to _____.	maintain uptake gas temperature above the dew point	maintain an excess of CO	protect the safety valves from excessive temperature	prevent excess air density	
13	280	D	If a main condenser were operating with a vacuum of 28.0 in. Hg, a condensate discharge temperature of 95°F, a seawater inlet temperature of 64°F and an overboard temperature of 72°F, which of the following would represent the condensate depression?	0.3 in. Hg	0.5 in. Hg	0.5°F	5.0°F	SG-0004
13	281	C	Turbine casing flanges are sometimes provided with a system of joint grooving to _____.	form a labyrinth seal between the casing halves	ensure perfect alignment of casing halves	inject sealing compound between the casing halves	increase contact pressure between the casing halves' flanges	
13	282	D	A convection type superheater in a D-type boiler is protected from radiant heat by _____.	generator tubes	convection currents	control desuperheaters	water screen tubes	
13	283	C	With reference to the chart, if a boiler generates saturated steam at 385.3 psig, how much heat per pound was required to change the water into steam if the feedwater temperature was initially 104.5°C?	96.85 BTU	97.15 BTU	1016.40 BTU	1196.45 BTU	SG-0004
13	284	B	One of the operating conditions sensed by a two-element feedwater regulator is _____.	feedwater flow	steam flow	fuel pressure	steam pressure	
13	285	D	The cooling water supplied to the vent condenser in a DC heater is _____.	seawater	fresh water	potable water	condensate	
13	286	C	In the boiler steam and water system, pressure is highest in the _____.	steam stop	dry pipe	feed line	mud drum	

13	287	C	If the theoretical quantity of dry air required to burn one pound of fuel oil is 13.75 pounds, what will be the weight of the air necessary to burn one pound of fuel when operating a boiler at 15% excess air?	14.44 pounds	15.13 pounds	15.81 pounds	16.50 pounds	
13	288	A	The boiler fuel oil system suction strainers are also known as the _____.	'cold' strainer	'hot' strainer	'fine' strainer	magnetic strainer	
13	289	C	On an automatically fired boiler, the loss of forced draft fan will result in which of the listed actions to be carried out?	Stopping of the feed pump	Stopping of the fuel oil service pump	Closing of the master fuel oil cutoff	All of the above.	
13	290	A	Clogged gas passages in a boiler may result in _____.	slag accumulations on refractory	overheated superheater support plates	warped water wall headers	rapid fouling of sprayer plates	
13	291	D	After one year of operating the bearing shown in the illustration, the reading obtained at point "A" would always be equal to the _____.	reading stamped on the gage only	designed oil clearance	designed oil clearance plus the stamped bridge gage reading	stamped bridge gage reading plus the bearing wear	SE-0017
13	292	C	A boiler superheater support tube differs from a standard generating tube in that the _____.	direction of flow of the steam and water mixtures differ	metals from which they are fabricated differ	outside diameters and wall thicknesses differ	method of heat transfer in the tube differs	
13	293	A	Scavenging air is supplied to steam soot blowers to _____.	prevent the backup of combustion gases into soot blower heads	provide cooling air when soot blower elements are rotating through blowing arcs	prevent the escape of steam into the inner casing	prevent warping of the cams when exposed to high temperature steam	
13	294	B	A two-element feedwater regulator not only responds to changes in water level, but is also designed to react to _____.	feedwater flow	steam flow	fuel flow	steam pressure	
13	295	B	Air leakage into the pump casing by way of the packing gland of a condensate pump is prevented by _____.	special packing in the stuffing box	a water seal line to the packing gland	an air seal line from the compressed air line	the vacuum in the pump suction	
13	296	B	Which of the piping systems listed is shown in the illustration?	Auxiliary exhaust	Auxiliary steam	Butterworth	Main feed	SG-0005
13	297	D	If the theoretical quantity of dry air required to burn one pound of fuel oil is 13.75 pounds, what will be the weight of the air necessary to burn one pound of fuel to operate a boiler at 20% excess air?	14.44 pounds	15.13 pounds	15.81 pounds	16.50 pounds	
13	298	B	Strainers are installed in boiler fuel oil service lines to _____.	absorb contaminants	remove solids	decrease viscosity	adsorb water	
13	299	D	Ferrous sulfate tends to go into solution when the hydrogen ion concentration is below 9.5. Consequently, the boiler water of a 900 psi plant should be _____.	pure with neutral pH	pure and treated to a pH of 4-4.5	maintained at a pH of 7.0	pure and treated to a pH of 10.5 to 11.0	

13	300	B	Under constant boiler load, the superheated steam temperature may rise above normal for the existing load if _____.	excess air is too low	feedwater temperature is too low	boiler water level is too high	combustion air is excessively hot	
13	301	C	A turbine diaphragm functions to _____.	support moving blades and shrouding in an impulse turbine	provide support for interstage packing in a reaction turbine	support the nozzles and guide the flow of steam in an impulse turbine	decrease steam velocity in the nozzles of an impulse turbine	
13	302	A	Which of the methods listed would be most effective in repairing a steam cut on a seating surface of a superheater handhole plate?	Filling the cut by welding and then grinding it smooth.	Filling the cut with iron cement or plastic steel.	Grinding the seating surface and installing an oversized gasket.	Refacing the surface and over torquing the handhole plate.	
13	303	A	The concentration of total dissolved solids in boiler water could increase as a result of _____.	infrequent bottom blows	zero water hardness	dissolved oxygen deaeration	priming and carryover	
13	304	C	Which type of feedwater regulator listed provides the MOST effective regulation of boiler water level under all operating conditions?	Single-element	Double-element	Triple-element	Monothermonic	
13	305	D	Flooding of the DC heater, due to the addition of excessive makeup feed, is normally corrected by the use of _____.	a condensate pressure regulating valve	a thermostatic steam regulating valve	the feed pump recirculating line	a manual or automatic dump valve to the reserve feed tank or distilled tank	
13	306	D	If a boiler generates saturated steam at 125.3 psig, how much heat is required to change the water into steam if the feedwater temperature is 240°F?	30.5 Btu/lb	116.5 Btu/lb	582.7 Btu/lb	984.7 Btu/lb	SG-0004
13	307	A	Excess air must be provided to an operating boiler to allow for _____.	complete combustion of fuel	fluctuations in boiler steam demand	heat losses up the stack	all of the above	
13	308	D	Strainers are installed in boiler fuel oil service lines to _____.	absorb contaminants	collect water	decrease viscosity	remove solids	
13	309	C	A boiler with a water capacity of 10 tons, generates steam at the rate of 30 tons per hour. If the feedwater quality is 0.5 ppm, the concentration of solids will increase 1.5 ppm every hour. What would be the increase in the concentration of solids within 24 hours?	12 ppm	24 ppm	36 ppm	48 ppm	
13	310	D	Air accumulated in the aftercondenser of the air ejector unit is discharged directly to the _____.	intercondenser	high pressure turbine	main condenser	atmosphere	
13	311	B	In what type of turbine is the moving blading and the intervening fixed rows of blading shaped so as to form convergent-divergent nozzles?	Impulse	Reaction	Impulse-reaction	None of the above.	
13	312	B	In a boiler water gage glass, a ball check valve is installed on the _____.	top connection only	bottom connection only	top and bottom connection	drain valve	

13	313	D	Should the superheater outlet thermometer indicate an excessively high temperature on a single furnace boiler, the cause could be _____.	dirty generating surfaces	too much excess air	the fuel oil being too viscous	all of the above	
13	314	B	In an automatically fired boiler, the steam pressure regulator controls the supply of fuel oil to the burners by responding to variations in the _____.	steam drum water level	steam header pressure	master fuel oil solenoid valve position	burner flame intensity	
13	315	C	Vent condensers are usually an integral part of deaerating feed heaters and serve to condense _____.	only steam vented from high pressure steam traps	steam vented from high pressure steam glands	the steam vapor entrained with the noncondensable gases	the gases liberated by the deaeration process	
13	316	B	A boiler working pressure is 460 psig. The safety valve lifts at 500 psig and blows down to 470 psig. The blowdown is what percentage of the working pressure?	5.50%	6.50%	7.50%	8.00%	
13	317	D	Too much excess air in a steaming boiler may be indicated by _____.	a white burner flame	a clear stack	white smoke	all of the above	
13	318	B	Strainers are installed in boiler fuel oil service lines to _____.	collect water	remove solids	decrease viscosity	absorb contaminants	
13	319	D	The concentration of total dissolved solids in the boiler water can increase as a result of _____.	frequent surface blows	dissolved oxygen deaeration	zero water hardness	insufficient blowdown	
13	320	C	The greatest deterrent to heat transfer from the fireside to the waterside of a boiler is _____.	water film	water eddies	gas film	gas eddies	
13	321	A	For large, main propulsion turbines the most commonly used turbine thrust bearing is the _____.	pivoted segmental shoe	overhung turbine wheel	self-aligning shell	self-oiling sleeve	
13	322	A	The minimum feedwater inlet temperature to a boiler economizer is determined by the _____.	dew point temperature of the stack gas	superheater outlet temperature	surface area of the third stage heater	radiant heat transfer in the furnace	
13	323	B	In automated boiler operations, a dirty flame scanner will most likely result in _____.	increased fuel oil consumption	securing fuel oil to the burner	loss of forced draft air	incomplete purge cycle	
13	324	B	The two-element feedwater regulator functions similarly to the three-element feedwater regulator, but does not utilize _____.	steam flow measurement	feedwater flow measurement	water level	drum pressure	
13	325	C	The purpose of the recirculating line between the turbine driven feed pump and the DC heater is to _____.	ensure a steady boiler water level at all loads	seal the labyrinth packing on the pump	ensure sufficient flow through the feed pump at low load	cool the vent condenser	
13	326	C	If a quantity of saturated steam consists of 90 percent steam and 10 percent moisture, the quality of the mixture is _____.	10%	80%	90%	100%	
13	327	B	When too much excess air is supplied to an operating boiler, the _____.	heat loss will be reduced	heat loss will be excessive	flame will impinge on the burner cone	flame will be a deep red color	

13	328	A	Which of the listed types of strainers are installed between the fuel oil heater and the burner manifold?	Duplex	Magnetic	Simplex	Self-cleaning	
13	329	B	Dissolved and suspended solids in boiler water are kept at minimum levels by _____.	using only volatile chemicals	frequently blowing down the boiler	treating the boiler water with phosphates	the introduction of oxygen scavenging chemicals	
13	330	D	Which of the listed devices may trip due to total flame failure in both boilers of an automated plant?	Individual burner solenoids	Main fuel header solenoids	Main turbine throttle valve	All of the above	
13	331	C	The astern element of a main propulsion turbine is usually _____.	multiple entry, helical flow	single entry, double flow	impulse staged	reaction staged	
13	332	A	Bi-color water level indicators, connected directly to the boiler drum, operate on the principle of _____.	different refractive properties of steam and water	special insoluble indicating fluids	different chemical properties of steam and water	different densities which result from the comparison of the varying steam pressure in the drum	
13	333	B	The difference between the temperature of the condensate discharge and the temperature corresponding to the vacuum being maintained at the exhaust inlet to the main condenser is defined as _____.	main circulator loss	condensate depression	condensate recession	absolute condenser temperature	
13	334	B	If the bellows in a thermo-hydraulic feedwater control valve ruptures, the boiler water level will _____.	increase only	decrease only	increase initially and then decrease	decrease initially and then increase	
13	335	C	Feedwater heaters are used aboard steam vessels to reduce thermal shock to the boiler and to _____.	increase plant mechanical efficiency	act as a heat sink for turbine bleed steam	improve thermal efficiency	reduce back pressure in the auxiliary exhaust line	
13	336	B	Which line on the graph indicates the Latent Heat of Fusion?	Line 1	Line 2	Line 3	Line 4	SG-0001
13	337	D	As the percentage of CO_2 in the stack gas decreases, you can assume that _____.	the fuel to air ratio is increasing	fuel is being burned with increasing economy	you are approaching secondary combustion	excess air is increasing	
13	338	A	The valve located between the fuel oil header and the burner valve is known as the _____.	root valve	return valve	header valve	register valve	
13	339	C	The end product of reactions occurring when boiler water is chemically treated, remain in the boiler and increase the need for _____.	acid cleaning	makeup feed	boiler blowdown	waterside corrosion treatment	
13	340	B	Why is superheated steam used in the main propulsion turbines instead of saturated steam?	Less specific energy available per pound of steam.	Greater heat energy available per pound of steam.	Higher pressure available than saturated steam.	Lower required specific volume than saturated steam.	

13	341	C	Reduction gear bearing bridge gage readings should be taken after _____.	rotating the journal to the point of minimum oil clearance	all bearing caps and all bearing halves are removed	rotating the bearing shell so that the point of maximum bearing wear is directly at the bottom	All of the above are correct.	
13	342	C	The purpose of the mica used in a boiler water gage glass assembly is to prevent _____.	overheating of the glass	light refraction in the glass	etching of the glass	leakage from the glass	
13	343	C	When the flame scanner senses flame failure during boiler operation, which of the listed events will occur FIRST?	The fuel oil service pump is stopped.	The automatic purge cycle commences.	The fuel oil solenoid valve is de-energized.	The 'trial for ignition' period commences.	
13	344	D	Improper boiler feedwater deaeration could be directly linked to _____.	operating with excessive condensate depression	fluctuating deaerating feed tank level as a result of taking on makeup feed too rapidly	fluctuating condensate pressure due to not maintaining proper hotwell level	all of the above	
13	345	A	In a closed feedwater system, the greatest deaeration of condensate occurs in the _____.	DC heater	atmospheric drain tank	air ejector condenser	vent condenser	
13	346	B	Most marine boilers are designed to produce _____.	superheated steam only	saturated and superheated steam	saturated steam only	superheated and supercritical steam	
13	347	A	Excessive combustion air in a boiler is indicated by the flame ends appearing as a/an _____.	shower of sparks	orange colored flame	dull red or black flame	light brown flame	
13	348	D	Fuel oil atomizers are used in boilers to _____.	control the temperature of fuel entering the furnace	control the amount of air entering the furnace	mix air and fuel together	break fuel oil into a fine spray	
13	349	A	A continuous blow is used to _____.	regulate the density or salinity of boiler water	remove scum from the surface of boiler water	permit air to escape while raising steam in a cold boiler	remove sludge from the bottom of the water drum	
13	350	B	Which of the following statements is true concerning the information tabulated in the table?	At 185.3 psig (1366.4 kPa), the saturation temperature of a mixture of water and steam is 377.51°F (192°C).	When one pound of water changes to one pound of steam at 200 psia (1378.8 kPa), its volume increases 124.41 times.	If one pound of steam at 250 psia (1723.5 kPa) condenses to one pound of water it will give up 843 BTU's (889.4 kJ) while changing state.	All of the above.	SG-0004

13	351	C	Which of the following statements is correct regarding axial thrust in a high pressure velocity-compounded turbine?	Most of the thrust produced is counter balanced by the action of a dummy piston.	Only a small portion of the thrust produced is counter balanced by the action of a dummy piston.	The thrust is minimized by equalizing holes drilled in the turbine wheels.	The thrust is transmitted to and absorbed by the high speed pinion and gear.	
13	352	C	Where is the 'dry pipe' located in a boiler?	At the superheater outlet	Behind the superheater screen tubes	In the top of the steam drum	Below the generation tube bank	
13	353	D	The weight of saturated steam is a factor dependent upon its _____.	density	temperature	pressure	All of the above	
13	354	C	The pressure in the feedwater system must exceed boiler steam drum pressure in order to _____.	prevent water hammer in the lines	prevent air leakage into the feedwater system	force the feedwater into the boiler	remove the steam from the steam drum	
13	355	B	Feedwater is deaerated to prevent _____.	cavitation in the feed pump	corrosion in the boiler	loss of system vacuum	all of the above	
13	356	A	Steam line water hammer can be best prevented by _____.	keeping lines drained and insulated	replacing all 90°Elbows with capped tees	always opening steam valves rapidly	keeping steam temperature below the saturation point	
13	357	D	White smoke coming from the stack of a main propulsion boiler indicates _____.	too much excess air	partially burned fuel particles are leaving the stack	excessive air velocity through the air registers	all of the above	
13	358	D	In a marine boiler equipped with mechanically atomized burner assemblies, proper combustion depends on the _____.	design and mechanical construction of the atomizers	speed of the forced draft fan and quantity of excess air	centrifugal force imparted to the oil in the atomizer	all of the above	
13	359	D	Which of the following statements is true concerning the use of hydrazine in boiler water treatment?	A reserve is maintained by continually adding it to the feedwater rather than the boiler water.	It removes free oxygen from the boiler without increasing total dissolved solid content.	It aids in maintaining the pH of the boiler water within the prescribed limits.	All of the above.	
13	360	A	The photoelectric cell installed as part of the combustion safety controls of an automatically fired boiler will _____.	sense light from the burner flame	control the modulating pressure control circuit	open the control circuit upon sensing an intense flame	close the control circuit upon sensing a flame failure	
13	361	C	Steam passing through a multistage impulse turbine does not impart any appreciable axial thrust to the rotor. This is primarily due to the _____.	pressure drop taking place in the moving blades	dummy piston and cylinder arrangement	equalizing holes provided in the turbine wheel	steam passing through the blades only once with the largest pressure drop taking place in the first-stage	
13	362	B	The glass used in a flat-type boiler water gage is protected from the hot steam and water by a/an _____.	asbestos gasket	mica shield	felt cushion	copper insulator	

13	363	B	In a given weight of steam, four-fifths is vapor and one-fifth is moisture. The steam in this mixture is best described as _____.	20% quality	80% quality	dry saturated	superheated	
13	364	C	Increasing the temperature of the feedwater entering the steam drum will ultimately result in a/an _____.	increase in stack gas temperature	increase in fuel consumption	decrease in the degree of superheat	decrease in the quality of steam entering the superheater	
13	365	C	Condensate is pumped from the condenser to the DC heater instead of directly to the boiler because _____.	boiler feed pumps must operate with a negative suction head	suspended solids in the condensate must be eliminated	condensate should be deaerated before entering the boiler	condensate at condensing temperature is too hot and will cause thermal stress in the boiler	
13	366	C	In what section of a boiler would you find a steam quality of 90%?	Superheater outlet	Desuperheater outlet	Steam drum	Last pass of the superheater	
13	367	B	Increased dry gas loss and reduced boiler efficiency result from carrying too much excess air because excess air _____.	varies with the degree of deposits on heat absorbing surfaces	increases the amount of stack gas weight and temperature	effects the amount of volatile matter and ash content of the fuel	reduces the amount of harmful impurities produced by burning residual fuel	
13	368	A	Fuel oil viscosity to the atomizer can be reduced by _____.	increasing the fuel oil heater steam supply	mixing heavier oil with the fuel	changing the atomizer orifice size	increasing fuel oil pressure	
13	369	A	The atmospheric drain tank is normally evacuated by _____.	vacuum drag to the main and/or auxiliary condenser	overflow to the bilges	vacuum drag to the main and/or auxiliary air ejector condenser	overflow to a distillate tank	
13	370	A	A flame scanner installed in modern boiler combustion control systems, functions to _____.	cut off the fuel supply when the fires go out	monitor the stack for soot fires	regulate the fuel oil pressure	sample the stack gases	
13	371	D	To minimize axial thrust in an impulse turbine, equalizing holes are located _____.	between the steam inlet and the front of the dummy piston	between the exhaust outlet and the front of the dummy piston	in each casing diaphragm	in each rotor wheel	
13	372	D	If the low water level alarm sounds on an automatically fired boiler, and the low water cutout fails to function, you must immediately _____.	blowdown the gage glass to determine where the water level is	increase the feedwater supply to maintain the water level	start the emergency feedwater injector to restore the normal water level	secure the fires to minimize damage to the boiler tubes	
13	373	A	Combustion control systems on automatic boilers are designed to prevent immediate burner ignition after a normal or safety shutdown in order to allow time for _____.	the furnace to be purged	electric charge buildup in the igniter	the fuel pump to start	the drum level to equalize	

13	374	D	When it is necessary to operate a turbine driven main feed pump at shut off head, or at 20% or less of its rated capacity, what will prevent the pump from overheating?	Throttling of the steam supply valve.	Throttling of the liquid discharge valve.	A bypass or recirculating line led back to the pump impeller eye or suction.	A bypass or recirculating line led back to the source of suction supply.	
13	375	B	Discharging an excessive amount of cold water into the DC heater during normal steaming conditions could cause _____.	flashing at the feed pump suction	excess oxygen in the feedwater	water hammer in the economizer	increased back pressure	
13	376	C	The turndown ratio an automatic combustion control system is the ratio _____.	of air to fuel for a given firing rate	of forced draft fan speed to feedwater flow	between the highest and lowest oil pressure at which the burner will remain lit	between fuel oil pressure and atomizing steam pressure at a given firing rate	
13	377	D	In a properly designed boiler, which of the end points should be reached first?	Carryover	Circulation	Evaporation	Combustion	
13	378	A	To obtain the best mixing of air and fuel with a fuel oil atomizer, you need to adjust the _____.	atomizer position using the distance piece	diffuser to the desired flow	primary and secondary air cones for desired air flow	total air volume admitted to the boiler furnace	
13	379	D	Dissolved oxygen can be removed from the boiler water by _____.	frequent surface and bottom blows	dumping and refilling the boiler weekly	passing the water through absorbent filters	treating the water with chemical scavengers	
13	380	C	Which of the following statements is true concerning a photocell flame scanning system?	The photocell requires a large amount of voltage.	The scanner head must be adjusted to sight the sensitivity link.	The scanner works in conjunction with the burner fuel oil (solenoid controlled) shut off valves.	The scanner window must be isolated from the forced draft fan air.	
13	381	C	When a turbine is in operation, a rotor position micrometer is used to determine any change in rotor _____.	radial position relative to the casing	radial position relative to the micrometer	axial position relative to the casing	axial position relative to the micrometer	
13	382	C	How is the nozzle in a nozzle reaction safety valve held in place?	Press fit	Lock nut	Machine threads	Spot weld	
13	383	A	If the control air pressure for an automatic combustion control system is lost during maneuvering, you should immediately _____.	switch to manual control	blowdown the air receiver	attempt to restart the air compressor	secure the boilers	
13	384	A	A turbine-driven centrifugal feed pump used for boiler feed service should normally be stopped by _____.	hand activating the overspeed trip	closing off the steam via the excess pressure pump governor	slowly closing the manual throttle	opening wide the recirculating valve and then manually closing the throttle	
13	385	C	To provide emergency feedwater supply to a steaming boiler if it becomes necessary to secure the DC heater, suction should be taken on the distilled water tank using the _____.	emergency injector discharge	feed booster pump	main feed pump	main condensate pump	

13	386	D	In addition to monitoring flame quality, flame scanners are used in combustion control systems to _____.	regulate the air/fuel ratio controller for more efficient combustion	secure the forced draft fans upon flame failure	automatically open the fuel oil solenoid valves	secure the fuel supply in the event of a flame failure	
13	387	C	In a properly designed boiler, which end point is most likely to occur first?	Evaporation	Circulation	Combustion	Moisture carryover	
13	388	C	Fuel oil passing through the burners is divided into fine particles by the _____.	diffuser	air register	sprayer plate	air foils	
13	389	D	Although accurate tests of boiler water for dissolved oxygen are difficult to obtain on board ship, you can be fairly certain of proper oxygen removal by _____.	testing frequently for total dissolved solids	maintaining low boiler water pH	giving the boiler frequent surface blows	testing boiler water for excess scavenging agents	
13	390	B	If an automatically fired burner ignites, but repeatedly goes out within two seconds, the cause could be a/an _____.	faulty pressure signal to the time delay relay circuit	dirty flame scanner window	burned out solenoid coil in the low fire oil valve	excessively high fuel oil temperature	
13	391	A	Where reaction turbine blading is fitted with shrouding of end tightened design, which of the following conditions will be the most critical to efficient turbine operation?	Rotor axial position	Diaphragm clearance position	Limiting the use of LP bleed steam	Operation through critical speed ranges	
13	392	A	On a boiler safety valve, the blowdown adjusting ring is locked in place by a _____.	set screw	locknut	wire seal	cotter pin	
13	393	A	Flame scanners are used with boiler combustion control systems to monitor flame quality and to _____.	shut off the fuel supply if flame failure is detected	secure the fuel oil service pump in the event of a floor fire	secure the forced draft fan in the event of a flame failure	regulate the fuel/air ratio controller for more efficient combustion	
13	394	D	Fuel oil settling tanks are used to _____.	store oil for immediate use	separate water and solids from the fuel	make stripping of sludge and water from fuel oil easier	all of the above	
13	395	D	Which of the DC heater operations listed will result in excessive dissolved oxygen in boiler water?	Excessively high water level in the heater.	Conical baffles carrying away.	Operating the heater with a closed air vent.	All of the above.	
13	396	C	Ultraviolet light sensing flame scanners installed on an automated main propulsion boiler, are designed so they _____.	might be misled by glowing brickwork	will be sensitive to the outer portion of flames	are sensitive only to the center of the ultraviolet portion of the flame from a particular burner	cannot be used with steam atomizing burners	
13	397	C	Which of the boiler end points should be reached first?	Water circulation	Moisture carryover	Combustion	Atomization	
13	398	B	The amount of oil atomized by a straight mechanical fuel oil burner depends on the sprayer plate size and the _____.	oil return pressure	fuel oil pressure	forced draft pressure	furnace air pressure	
13	399	A	What are the two most common gases that dissolve in boiler water and cause corrosion on the internal parts of the boiler?	Oxygen and carbon dioxide	Oxygen and carbon monoxide	Oxygen and ammonia	Oxygen and nitrogen	

13	400	A	Which of the following represents a significant system limitation to be aware of when a burner management system is operated in the 'HAND' mode?	Some boiler safety interlocks are bypassed when the boiler is 'HAND' fired.	The burner is not capable of maintaining a high firing rate when the boiler is in the 'HAND' mode.	The flame failure alarm cannot function when the boiler is 'HAND' fired.	The burner sequence control is fully automatic even in the 'HAND' mode.	
13	401	B	What happens to the steam as it moves across the moving blades in a reaction turbine?	It gains velocity at constant pressure.	It creates an axial thrust in the direction of the steam flow.	It loses velocity at constant pressure.	It creates an axial thrust opposing the direction of steam flow.	
13	402	D	An advantage of using boiler furnace studded water wall tubes packed with refractory is that _____.	thinner tubes can be used	thicker tubes are required	lower quality steel can be used	the use of dense firebricks is not required	
13	403	B	If the water level in the boiler water gage glass is not in sight, and the automatic feedwater regulator is in the closed position, the _____.	safety valve should be lifted by hand	fires should be shut off	boiler water gage is faulty	bottom blow should be opened	
13	404	B	Which of the following systems is designed to use auxiliary exhaust steam?	Steam fuel oil atomizers	Deaerating feedwater heater	Air ejectors	Standby lube oil pumps	
13	405	A	During cold ship start-up, you should open the feedwater outlet and condensate valves to a DC heater in order to _____.	avoid running the feed pump 'dry'	expel noncondensable vapors from the vent	thoroughly atomize incoming condensate	prevent excessive pressure	
13	406	C	In a boiler automation system, if a burner fuel oil solenoid valve continually trips closed under normal steaming conditions, you should _____.	wedge the valve in the open position and report it to the chief engineer	bypass the solenoid valve and enter the fact in the logbook	secure the burner and determine the cause of the valve failure	wedge the valve in the open position and reduce the fuel oil pressure at that burner	
13	407	D	The 'end point for combustion' for a boiler furnace is reached whenever _____.	the amount of heat being transferred to the tubes reaches a maximum no matter how much the firing rate is increased	panting of the furnace accompanied with black smoke takes place	the maximum rate at which the boiler can generate steam	the capacity of the sprayer plates at the designed pressure for the system is attained	
13	408	D	The degree of fuel oil atomization is dependent upon the _____.	boiler furnace size and shape	air pressure at the furnace	air supply temperature	atomizer design	
13	409	D	Chemicals are added to boiler feedwater to _____.	reduce the frequency of blowdowns	prevent precipitation of sludge	retard heat transfer	prevent oxygen corrosion	
13	410	B	While your vessel is steaming with one boiler, the automatic combustion control system sensing line for the idle boiler is accidentally opened. How will this effect the steaming boiler?	The steam pressure will drop.	The steam pressure will rise.	The water level will rise.	The water level will drop.	

13	411	C	Packing rings installed on auxiliary turbines are lubricated by _____.	separate lube oil lines	a water leak off line	moisture in the turbine steam	a salt water service line	
13	412	C	When the automatic combustion control fails, what should you do to control the air supply to a boiler?	Reduce the firing rate.	Open the forced draft fan crossover damper.	Shift to remote manual operation.	Secure the boiler.	
13	413	C	When conducting a routine hydrostatic test on a water-tube boiler, you should _____.	raise the temperature of the boiler water to 180°F	apply hydrostatic pressure equal to the maximum allowable working pressure of the boiler	have gags installed on all safety valves	bypass the economizer	
13	414	A	Under normal operating conditions, a drop in the steam temperature leaving an uncontrolled interdeck superheater could be caused by a _____.	decrease in combustion gas velocity through the superheater	decrease in steam velocity through the superheater	drop in the feedwater temperature	badly fouled economizer	
13	415	C	If the boiler water and condenser hotwell levels are normal, but the DC heater level is only 30% of full, you should _____.	increase the speed of the condensate pump	open the feed pump recirculating valve wide	open the makeup feed	bypass the vent condenser and third-stage feed heater	
13	416	C	Auxiliary exhaust steam can generally be used as a supply for the _____.	air ejectors	steam atomizers	air heater supply	fuel oil heaters	
13	417	C	Reaching which of the boiler end points listed could cause the most damage to a boiler?	Combustion	Moisture carryover	Circulation	Heat transfer	
13	419	A	High salinity can be reduced in a steaming boiler by adding caustic soda, phosphate, and then _____.	using the continuous blowdown	steaming at a low firing rate for 24 hours	adding hydrazine to control dissolved oxygen	adding calcium carbonate to precipitate solids	
13	420	B	The main purpose of the component shown in the illustration is to _____.	permit expansion during pressure surges	prevent thermal shock	reduce vibration	reduce the possibility of priming	SG-0006
13	421	B	In a cross-compounded turbine, steam enters the _____.	high pressure, intermediate and low pressure units simultaneously	high pressure unit and then flows to the low pressure unit	high and low pressure units simultaneously	high pressure unit and then flows to another high pressure unit	
13	422	A	Which normally closed valve would have to be at least partially open prior to actually lighting off a cold boiler as shown in the illustration?	J	F	D	C	SG-0009
13	423	B	Which of the following systems can normally be supplied by auxiliary exhaust steam?	Main feed pump	Low pressure evaporator	Air ejectors	Boiler steam atomizers	
13	424	A	Under normal conditions, the rate of heat transfer in a feedwater heater is most greatly affected by the _____.	temperature differential between the steam and feedwater	density of the feedwater	pH of the feedwater	speed of the main feed pump	

13	425	A	The purpose of the steam control valves installed in the steam supply line to the DC heater is to _____.	control steam admission and to maintain the proper spray pattern	regulate back pressure in the auxiliary exhaust line	preheat the condensate before it enters the vent condenser	seal the vent to prevent the escape of condensate	
13	426	D	Which set of boiler end points listed is considered to be the normal order of occurrence?	Circulation, combustion, carryover	Combustion, circulation, carryover	Circulation, carryover, combustion	Combustion, carryover, circulation	
13	427	A	Which of the listed characteristics of fuel oil establishes the danger point as far as transferring, pumping, and firing procedures are concerned?	Flash point	Fire point	Viscosity	Specific gravity	
13	428	D	Which of the terms listed represents the ratio between the highest and lowest fuel oil pressure at which the burners will remain ignited?	Air/fuel ratio	Modulating band ratio	Firing range ratio	Turndown ratio	
13	429	B	If a routine boiler water test indicates high salinity, you should blowdown the boiler to reduce salinity and then _____.	add carbonates to control sludging	treat the boiler water with phosphates	reduce the firing rate to prevent scaling	increase the firing rate to prevent foaming	
13	430	D	The steam soot blower piping should be thoroughly drained before operating to prevent _____.	accidental flameout	feedwater losses	nozzle plugging	erosion of refractory	
13	431	A	In a cross-compounded turbine operating at full load, the total available steam energy is approximately divided between the HP and LP in the ratio of _____.	1:01	2:01	3:01	4:01	
13	432	D	The turbogenerator steam stop is located between the superheater outlet and the main steam stop valve to _____.	provide for easier access	provide higher quality steam for the turbogenerators	provide a flow of cooling steam through the control desuperheater	allow the use of superheated steam in the turbogenerator without pressurizing the larger main steam line	
13	433	C	The component shown in the illustration depicts a/an _____.	safety valve escape pipe expansion joint	spray attemperator with a thermal sleeve	internal feed pipe and shell connection	dry pipe and shell connection	SG-0006
13	434	B	An increase in the pressure drop between the inlet and outlet of the feedwater heater waterside, not due to a waterside obstruction, would indicate _____.	insufficient water velocity through the heater	a water flow rate higher than feedwater heater design limits	fouling of the heater steam side	an accumulation of noncondensable gases in the steam circuit	
13	435	C	Which of the drains listed could be led directly to a DC heater operating at 35 psig (343 kPa)?	Drain inspection tank overflow only.	Contaminated evaporator relief valve drain only.	An auxiliary steam line drain.	Only those steam drains which operate at 35 psig (343 kPa) or less.	
13	436	C	Which of the following systems can be supplied by the auxiliary exhaust system?	Main feed pump	High pressure evaporator	Boiler air heaters	Boiler steam atomizers	

13	437	A	The connections labeled "A" in the illustration, are used to _____.	maintain a vacuum in the shell of the feed water heater	provide a point of admission for the steam air heater drains	provide a point of admission for the L.P. bleed steam	drain condensate from the feed water heater to the main condenser	SG-0025
13	438	A	Under normal operating conditions, a drop in the steam temperature leaving an interdeck-type superheater can be caused by a decrease in the velocity of the _____.	combustion gas flowing around the superheater tubes	steam flowing through the superheater tubes	steam flowing through the desuperheater	steam entering the dry pipe	
13	439	B	In addition to the repeated use of surface blow to control boiler water chemistry, caustic soda may be used to treat high salinity, as well as _____.	calcium chromate, for oxygen control	phosphate, to aid in scale prevention	calcium carbonate, to assist in precipitating solids	calcium sulfate to reduce priming	
13	440	A	Upon taking over the watch, while the vessel is at sea speed, you find the following conditions to exist. Which condition should be attended to first and why should this step be taken?	Excessive recirculation of condensate. Failure to properly adjust may cause an increase in condenser level leading to a decrease in condenser vacuum.	Salted up evaporator dumping to bilge. Must immediately be restarted to prevent insufficient quantities of distilled and potable water.	High level in fuel oil sludge tank. Necessary to pump contents to settler to prevent overflow of tank into the bilges.	Leaking air line to auxiliary exhaust live steam makeup valve actuator. Repair or place in bypass control to insure proper pressures in the auxiliary exhaust steam system.	
13	441	B	A turbine assembly in which steam flows in series through a high pressure turbine and then on to a low pressure turbine, with both turbines driving a common reduction gear through separate shafts, is classed as _____.	dual series	cross-compound	tandem-compound	tandem, double flow	
13	442	C	The main steam stop valve on a "D" type boiler is located at the _____.	desuperheater outlet	desuperheater inlet	superheater outlet	superheater inlet	
13	443	A	Dirty generating tube surfaces may cause higher than normal superheater outlet temperatures because _____.	the boiler must be overfired to maintain the required rate of steam generation	the temperature of the gas leaving the generating banks will be lower than normal	the screen tubes absorb excessive heat and transfer the increased temperature to the superheater	gas laning will result causing overheating of the superheater	
13	444	C	If there is a sudden drop in the outlet temperature of an uncontrolled superheater, you should _____.	increase the firing rate	bypass the air heater	check the water level in the drum	reduce the forced draft fan speed	
13	445	C	In a modern high pressure steam plant, most feedwater deaeration takes place in the _____.	atmospheric drain tank	air ejector condenser	DC heater	vent condenser	

13	446	A	The feed water heater shown in the illustration is actually comprised of three separately functioning heat exchangers. These heat exchangers are identified as the _____.	first stage heater, gland exhaust condenser, and drain cooler	first stage heater, inter condenser, and after condenser	inter condenser, after condenser, and gland exhaust condenser	drain cooler, distillate condenser, and fresh water drain collector	SG-0025
13	447	D	The limiting factor in determining the end point for combustion is usually the _____.	shape of the burner	size of only the sprayer plates	fuel oil pressure as the only concern	ability of the forced draft fan to supply combustion air	
13	448	D	Improper atomization can be caused by _____.	low draft air pressure	using the same size burner tips in all burners	using small sprayer plates	dirty sprayer plates	
13	449	D	In a steaming boiler most dissolved chlorides tend to concentrate at or near the _____.	tube joints	feed pipe	mud drum	water surface	
13	450	D	The upper section of the feed water heater indicated by "G" in the illustration is used as the _____.	drain cooler	gland exhaust condenser	after condenser	first stage heater	SG-0025
13	451	B	In an impulse turbine, the fixed blades function to _____.	decrease steam velocity	change the direction of steam flow	equalize pressure differences	prevent steam turbulence	
13	452	B	The main steam stop bypass valve is used to _____.	isolate the main steam stop for repairs while steaming	gradually increase the pressure and temperature of the main steam piping when warming up	cross-connect two steaming boilers	supply auxiliary steam when the main steam stop is closed	
13	453	B	The mid section of the feed heater, indicated by "F" in the illustration is used as the _____.	drain cooler	gland exhaust condenser	after condenser	first stage heater	SG-0025
13	454	A	The lower section of the feed heater, labeled "E" in the illustration is used as the _____.	drain cooler	gland exhaust condenser	after condenser	first stage heater	SG-0025
13	455	D	Under normal conditions, steam to the DC heater is supplied directly from which of the systems listed?	Main steam	600 psi auxiliary steam	150 psi auxiliary steam	Auxiliary exhaust steam	
13	456	B	A slight vacuum is maintained in the shell of the first stage heater that is part of the feed water heater shown in the illustration. The primary reason for the vacuum is to _____.	provide a low pressure area to guarantee feed water flow to the heater	maintain a positive flow of steam supplied by main engine bleed system	force the use of the main condenser as the drain cooler	avoid the necessity of having to use the condensate pumps	SG-0025
13	457	B	Insufficient combustion air supply to the furnace would cause _____.	the fires to sputter	low superheater outlet temperature	high stack temperature	high feedwater consumption	
13	458	B	Which of the following statements is correct concerning the operation of the level or drain regulator associated with the feed water heater shown in the illustration is correct?	The regulator maintains the flow of steam into the first stage heater of this unit.	The regulator controls the level of condensate collected in the drain cooler section.	The regulator controls the flow rate of condensate leaving the feedwater outlet.	The regulator controls the volume of condensate leaving the gland exhaust condenser.	SG-0025

13	459	C	The feedwater heater shown in the illustration was designed to maintain the required feedwater outlet temperature with an approximate 10" (25.4 cm) Hg shell vacuum. If the shell vacuum is increased to approximately 16" (40.64 cm) Hg vacuum, the _____.	overall plant operating efficiency will increase	vacuum in the main condenser will drop as the feed heater shell vacuum increases	feedwater outlet temperature will decrease	flow rate of condensate to the feed heater will increase	SG-0025
13	460	D	The feedwater heater shown in the illustration was designed to maintain the required feedwater outlet temperature with an approximate 10" Hg shell vacuum. If the shell vacuum is decreased to approximately 8" Hg vacuum, the _____.	overall plant efficiency will increase	vacuum in the main condenser will increase as the feed heater shell vacuum increases	flow rate of condensate to the feed heater will decrease	feedwater outlet temperature will increase	SG-0025
13	461	D	The designed function of fixed blades in an impulse turbine is to _____.	prevent steam turbulence	decrease steam velocity	equalize pressure differences	change the direction of steam flow	
13	462	B	The bottom blow valve on a water-tube boiler is usually attached to the _____.	steam and water drum	boiler mud drum	external downcomers	floor tubes	
13	463	C	Which of the following statements is true concerning the piping system shown in the illustration?	A "Y" strainer is utilized downstream of the Butterworth heater regulating valve to guard against foreign matter entering the heater tube bundle.	All high pressure piping connections are to have welded ends.	A moisture seperator is installed before the steam whistle.	All of the above.	SG-0005
13	464	B	If the drain regulator used in the operation of the combined L.P. feed water heater, shown in the illustration, is incorrectly set to maintain too high of a level (condensate level covers approximately the lower half of tubes in the first stage heater) the resulting operation will _____.	cause no adverse operating effect	cause the feed water temperature to drop below the required designed operating temperature	cause the feedwater temperature to increase above the designed outlet temperature	cause the automatic make-up feed valve to cycle open	SG-0025
13	465	C	During normal operation the steam flow from the auxiliary exhaust line to the DC heater is a function of _____.	spring pressure of the spray valves	water level in the DC heater reservoir	rate of condensation in the DC heater	rate of evaporation in the DC heater	
13	466	D	The connections labeled "D" in the illustration _____.	maintain a vacuum in the shell of the feed water heater	provide a point of admission of the steam air heater drains	provide a point of admission of the L.P. bleed steam	drain condensate from the feed water heater to the main condenser	SG-0025
13	467	A	Insufficient combustion air supply to a boiler furnace can cause _____.	low superheater temperature	high stack temperature	high superheater temperature	sputtering fires	

13	468	A	A burner atomizer improperly positioned in the distance piece, may cause _____.	oil impingement on furnace walls	slag formation on the screen tubes	erosion of the screen tube baffles	the ends of the flame, farthest from the atomizers, to be a yellowish orange, or golden shade	
13	469	A	Calcium minerals in boiler water are precipitated out of solution by the use of which of the listed chemicals?	Sodium phosphate	Sodium hydroxide	Phenolphthalein	Caustic soda	
13	470	C	A boiler internal feed pipe is perforated to _____.	provide positive flow to the downcomers	create a slight turbulence in the steam drum	distribute water evenly throughout the steam drum	reduce the weight of the steam drum internals	
13	471	A	Gland sealing steam is used on propulsion turbines to prevent _____.	air leakage into the turbine	steam leakage through the casing drains	overheating of the labyrinth packing	reversed steam flow at interstage bleeds	
13	472	B	Boiler fuel savings gained by the use of an economizer can amount to _____.	three percent for each 5°F rise in feed water temperature	one percent for each 10°F rise in feed water temperature	one half percent for each 15°F rise in feed water temperature	three percent for each 20°F rise in feed water temperature	
13	473	D	A photoelectric cell is installed in an oil fired boiler safeguard system to introduce proper resistance values to the electronic control circuit. This device is primarily sensitive to _____.	light emitted from the back wall incandescent brickwork	light emitted from the front wall incandescent brickwork	the orange portion of the flame spectrum	the blue portion of the flame spectrum	
13	474	D	Treatment of boiler feedwater for the control of hardness is necessary to prevent _____.	excessive feedwater alkalinity	foaming	carryover	waterside scale deposits	
13	475	B	In a DC heater, which source of steam is commonly used to heat and deaerate condensate?	Root steam	Auxiliary exhaust steam	Main steam	Auxiliary steam	
13	476	C	Low steam pressure in a steaming boiler can be caused by _____.	low steam demand	high feedwater temperature	low water level	large sprayer plates	
13	477	C	Which of the following boiler stack (smoke color) conditions indicates efficient combustion?	Black haze	White haze	Brown haze	Yellow haze	
13	478	C	If the temperature of the fuel oil entering an atomizer is too low, the burner will _____.	dribble fuel and smoke white	require more fuel for atomization	produce heavy black smoke at any load condition	require more excess air for combustion	
13	479	C	Of the impurities commonly found in marine lubricating oil, which of the following can NOT be removed by a centrifugal purifier at normal operating temperatures?	Water	Carbon particles	Soluble sludge	Metal particles	
13	480	A	If the boiler water level of one boiler drops out of sight while your vessel is steaming, and the burners have been secured, you should _____.	slow down the main engine	close the main steam stop	start the standby feed pump	blowdown the gage glass	

13	481	C	When a high pressure turbine is operating at sea speed, the pressure of the steam leaking through the shaft gland packing may be slightly higher than the pressure setting of the gland seal regulator. In this situation, the excess steam at the regulator is directed to the _____.	gland exhaust condenser	excess steam condenser	main condenser	auxiliary exhaust system	
13	482	A	The phrase 'boiler water column' as defined in the regulations, refers to the _____.	water level indicator	vertical water leg	pressure head to the feedwater pump suction	pressure gauge reading in feet of water	
13	483	C	Which of the following statements best describes the actions occurring to the oil as it flows through a disk type centrifugal purifier?	The purified oil is only thrown outward and away from the spindle of the machine.	Water, along with most of the dirt and sludge, is discharged past the discharge ring, located at the top of the bowl.	Most of the dirt and sludge is forced to accumulate on the vertical surfaces of the bowl.	As the dirty oil flows down through the distribution holes in the disks, the high centrifugal force causes the water to move outward.	
13	484	D	Coast Guard Regulations (46 CFR) permit copper pipe used in steam service to be subjected to a maximum pressure and temperature of _____.	350 psi and 460°F (2413 kPa and 237.7°C)	350 psi and 406°F (2413 kPa and 207.8°C)	250 psi and 460°F (1723 kPa and 237.7°C)	250 psi and 406°F (1723 kPa and 207.8°C)	
13	485	B	Dissolved oxygen in the condensate can result from _____.	steam leaks into the gland leakoff	air leaks through the turbine glands	improper operation of the gland exhauster	vapor lock in the condensate pump	
13	486	A	Coast Guard Regulations (46 CFR) permit repairs to boiler safety valves while installed on a main propulsion boiler and may be made by _____.	the chief engineer in an emergency	any competent person on the ship	an approved repair facility only	only the safety valve manufacturer	
13	487	B	Incomplete combustion due to insufficient air yields an excess amount of _____.	carbon dioxide	carbon monoxide	nitrogen oxide	sulfur dioxide	
13	488	B	If a burner were inserted too far into the boiler furnace, it could cause carbon deposits on the _____.	furnace opening	burner tip	air cone	register doors	
13	489	D	To minimize metal corrosion, boiler water is best kept _____.	fairly acidic	slightly acidic	neutral	alkaline	
13	490	C	In a disk type centrifugal purifier, the bowl is mounted on the upper end of the _____.	worm wheel	radial thrust bearing	bowl spindle	friction clutch	
13	491	B	Bridge gage readings are to be taken on the bearing shown in the illustration. You would use the indicated 3 3/4"R to _____.	identify the bearing by radius	center the bearing load point	center the bridge gauge	measure the angle to bridge gauge	SE-0017
13	492	D	The boiler feed check valves are located at the _____.	DC heater outlet	feedwater heater outlet	boiler water drum	economizer water inlet	
13	493	C	A centrifuge should satisfactorily remove which of the listed substances from lube oil?	Fuel oil	Gasoline	Water	Diesel fuel	

13	494	A	A sulfite test is performed on boiler water to determine the amount of _____.	excess sulfite present	excess nitrate present	dissolved iodate present	carbon dioxide present	
13	495	A	Which of the following statements represents the function of a turbine gland exhaust condenser?	Assists in preheating the condensate before it enters the DC heater.	Recovers condensate formed at the gland seal exhaust leak off.	Directs the gland exhaust from the turbine sealing glands to the air ejector suction.	Recovers condensate from the gland leakage around the ahead and astern throttle valves.	
13	496	C	Coast Guard regulations require that the relieving capacity of boiler safety valves must be checked _____.	at least once a year	at least once every 4 years	when the generating capacity of the boiler is increased	when repairs have been made to the safety valves	
13	497	C	Insufficient air for combustion in a boiler furnace could result in a _____.	white incandescent flame	high flame temperature	black stack smoke emission	0% carbon monoxide level	
13	498	A	Which of the following represents the function of the diffuser used with a mechanical atomizing oil burner?	Provide flame stability at the atomizer tip.	Control the amount of secondary combustion air.	Complete the vaporization of the fuel for combustion.	Finely divide the fuel particles into a cone-shaped spray.	
13	499	D	A sulfite test is conducted on boiler water to check for _____.	nitrates	sulfates	phosphates	excess oxygen scavenging agents	
13	500	A	One function of the disks, in a disk-type centrifugal purifier, is to divide the bowl space into many separate passages to _____.	minimize agitation of the oil-water mixture	increase hydraulic head needed for proper circulation	completely filter out suspended particles	prevent bowl spindle vibration	
13	501	D	The main propulsion shaft turning gear usually connects to the free end of the high-speed high pressure pinion because the _____.	lubricating oil from the high-speed pinion can easily supply the turning gears	turning gears are double reduction worm type and cannot mate with the low pressure high-speed pinion	arrangement allows for the use of a muff type coupling for flexibility and smooth engagement	greatest gear ratio between the turning gear motor output and bull gear can be obtained	
13	502	A	A boiler feed stop-valve must be mounted _____.	between the feed check valve and the boiler drum	between the feed pump and the feed check valve	upstream of the feedwater regulator	at or near the engine room operating platform	
13	503	B	A boiler internal feed pipe is perforated to _____.	provide positive downward circulation at high loads	distribute the feedwater throughout the steam drum	reduce back pressure in the feedwater piping	reduce the overall weight of the drum internals	
13	504	A	When the flow of oil admitted to a disk-type centrifugal purifier is in excess of its designed capacity, which of the following conditions will usually occur?	The oil will discharged through the heavy phase discharge port.	The speed of the centrifuge will increase.	All water will be retained by the purified oil being discharge.	Oil will be present in the water sealing line to the bowl.	
13	505	B	The gland exhaust fan draws steam and noncondensable vapors from the gland exhaust condenser and discharges to the _____.	atmospheric drain tank	atmosphere	main condenser	vent condenser	

13	506	B	The water level in a steaming boiler has risen to within 2 inches of the top of the top gage glass. Your immediate action should be to _____.	secure the fires	reduce the feedwater flow to the boiler	secure the feedwater flow to the boiler	open the surface blow line	
13	507	C	Insufficient combustion air supply will cause an atomizer flame to appear as a _____.	ragged flame	pointed flame	dull red flame with black streaks	light yellow flame with white streaks	
13	508	C	The purpose of the diffuser in a boiler burner assembly is to _____.	break up fuel oil into a fine spray	assist combustion by heating incoming air	shield the flame from the incoming air blast while allowing some mixing of fuel and air	diffuse flame to all corners of the furnace	
13	510	B	Prior to relieving the watch you should first check the fireroom status by verifying the boiler steam drum level and _____.	lube oil temperature	fuel pressure to the burners	water drum level	steam atomization temperature to the mechanical atomizers	
13	511	C	A nozzle in an impulse turbine functions to _____.	reverse steam flow direction	guide the steam through the fixed blades	convert the steam's thermal energy to kinetic energy	convert the steam's kinetic energy to thermal energy	
13	512	B	Steam baffles are used in the steam drum of a water-tube boiler to _____.	support the drum safety valve nozzles	reduce the possibility of carryover	extend the internal feed pipe	remove boiler water dirt deposits	
13	513	C	Which of the following chemicals is used in an Orsat apparatus to absorb carbon dioxide?	Cuprous chloride	Pyrogallic acid	Potassium hydroxide	Potassium chromate	
13	514	A	Any feedwater testing done on a routine basis would normally include testing for _____.	chloride	phosphate	electrical conductivity (total dissolved solids)	all of the above	
13	515	B	When raising vacuum on an auxiliary condenser, which of the following steps is necessary?	Close the makeup feed drag line to raise hotwell level.	Open the auxiliary condensate recirculation valve from the auxiliary air ejector condenser outlet.	Rotate turbine with hand jacking gear while applying gland seal steam.	Close condensate pump vent line to eliminate air leaks.	
13	516	B	When operating under constant load, the superheated steam temperature may rise above normal if the _____.	excess air is too low	feedwater temperature is too low	feedwater temperature is too high	boiler is priming	
13	517	A	Assuming all burners are clean and the fuel oil is at the correct temperature, it is considered good practice to adjust the excess air until a light brown haze is obtained. With the aid of a chemical based flue gas analyzer, the percentage readings (not necessarily in order) should indicate _____.	no CO, low O2, and high CO2	low CO2, no O2, and high CO	high CO, high CO2, and no O2	high O2, low CO, and low CO2	
13	518	B	The measured gap between the face of the burner atomizer tip nut and the diffuser plate, is determined by the setting of the _____.	atomizer tip nut	distance piece	sprayer plate	diffuser plate	

13	519	D	Chemicals are added to boiler water by injecting them _____.	as a powder into the mud drum	as a powder into the steam drum	in solution into the main feed line	in solution through the chemical feed pipe	
13	520	D	The size of the discharge ring used in a lube oil purifier is determined by the oil's _____.	viscosity	moisture content	sediment content	specific gravity	
13	521	C	A factor in determining the minimum steam temperature required at the turbine inlet is the _____.	horsepower of the turbine	vacuum in the condenser	moisture content in the steam at the LP end of the turbine	specific volume of the steam in the low pressure end of the turbine	
13	522	D	Combustion gases can leak into the fireroom through _____.	desuperheater seals	fouled burner registers	idle burner assemblies	soot blower swivel tube packing glands	
13	523	C	Coast Guard Regulations (46 CFR) prohibit which of the following pipe fittings from being installed in fuel oil service discharge piping?	Pipe unions	Screwed bonnet valves	Street ells	Bolted flange joints	
13	524	A	Natural circulation in a marine boiler is a result of _____.	the difference in the densities of the fluid in the downcomer and riser circuits	the fact that the specific weight of steam is greater than water	the velocity imparted to the feedwater by the feed pump	the turbulence of high pressure feedwater entering the steam drum	
13	525	A	While vacuum is being raised on the main unit and the turbine warmed, condensate is recirculated to the main condenser to _____.	ensure the condensation of air ejector steam	cool the main condenser shell for better vacuum	provide a condenser vacuum seal	maintain a proper DC heater water level	
13	526	C	Why should a boiler furnace be purged before the first burner is lit off?	To control air pressure in the windbox.	To ensure a proper fuel to air ratio.	To clear the furnace of any explosive gases.	To make the fires easier to light.	
13	527	A	White stack smoke could indicate _____.	excessive air leakage through the inner casing	low atomizer fuel temperature	insufficient air for combustion	excessive furnace combustion temperature	
13	528	C	The diffuser of a burner register assembly _____.	acts as a shield to prevent flare back	shapes the fuel particles into a cone	serves to make the air mix evenly with the oil	adds heat to the fuel particle cone	
13	529	B	Which of the following precautions should be observed when adding treatment chemicals to the boiler compound tank?	Cool the feedwater before it enters the tank.	Ensure there is no pressure on the tank before opening it.	Raise the boiler water level before adding chemicals.	All of the above.	
13	530	A	Scavenging air is supplied to steam soot blower elements to _____.	prevent back up of combustion gases into soot blower heads	provide cooling air when soot blower elements are rotating through blowing arcs	prevent build up of soot on the element	prevent overheating of adjacent tubing	
13	531	C	When a turbine rotor is not rotating during maneuvering, the heat tends to be concentrated at the _____.	turbine bleed lines	exhaust trunk	top of the turbine	casing joints	

13	532	A	Which of the valves listed should be closed before lighting off a boiler?	Economizer drain valve	Air cock valve	Superheater vent valve	Superheater drain valve	
13	533	B	The bulk of the solid material entering a centrifugal purifier with lube oil is _____.	discharged with the water	trapped in the bowl	trapped in the filter	forced out the overflow	
13	534	A	Excess free oxygen in the boiler feedwater can result from _____.	improper operation of the DC heater	steam leaks through the turbine glands	improper operation of the gland exhauster	vapor lock in the boiler feed pump	
13	535	B	In a marine condenser designed with a reheating hotwell, the hotwell is reheated by _____.	recirculation of condensate	steam lanes in the condenser	a branch line from the air ejector steam supply	submerged heating coils supplied with auxiliary exhaust steam	
13	536	D	To properly use a tube expander, the expander should be placed in the tube to be rolled so that the _____.	belling section is flattened against the tube sheet	rollers bear on the portion of the tube which needs belling	mandrel is in direct contact with the inner-tube sheet	rollers bear on the portion of the tube which is in the tube sheet	
13	537	B	Black smoke issuing from the boiler stack can be caused by an improper fuel/air ratio and by _____.	excessively high fuel pressure	low fuel temperature	high fuel temperature	low fuel pressure	
13	538	D	When used as a separator, a centrifugal purifier may lose its seal and cause _____.	water to contaminate the lube oil	the purifier pump to lose suction	water flow from the oil discharge	oil flow from the water discharge	
13	539	D	In a water-tube boiler, sludge is most likely to collect in the _____.	generating tubes	downcomer tubes	screen tubes	floor tubes	
13	540	C	Longitudinal expansion of a boiler water drum is allowed for at the boiler _____.	tube sheet	casing joints	foundation sliding feet	refractory expansion joint	
13	541	D	Before placing the jacking gear in operation on a main turbine unit, you must always _____.	start the gland seal steam	start the main circulating pump	line up the condensate system	line up and start the lube oil system	
13	542	A	Slag buildup on boiler furnace refractory is undesirable because it causes _____.	peeling or spalling of the brickwork	excessive cooling of the brickwork	shrinking of the brickwork	fracturing of the anchor bolts	
13	543	B	A boiler is to be secured in port. After the burners have been secured, the forced draft fan and air registers should be secured _____.	immediately after carrying out the former procedures	after any oil on the furnace floor has been burned off and cleared of combustion gases	after 30 minutes has elapsed, after carrying out these procedures	after at least 1 hour has elapsed, after carrying out these securing procedures	
13	544	B	The major reason dissolved gases are removed from boiler feedwater is because they may cause _____.	condenser vacuum loss	corrosive conditions in the boiler	a false boiler water level	vapor lock in the feed pumps	
13	545	B	The main condenser is designed with a reheating hotwell. What will occur if the condensate level rises above the top of the hotwell, yet remains below the bottom row of tubes?	Vacuum will decrease.	Condensate temperature will decrease.	Condensate temperature will increase.	The air ejectors will overheat.	
13	546	B	Water-tube boiler screen tubes protect which of the listed components from high furnace temperatures?	Saturated steam tube bank	Superheater tube bank	Water drum	Refractory	

13	547	D	The boiler uptake periscope appears completely black, this could indicate _____.	too much air	too little air	a burned out light bulb	All of the above are correct.	
13	548	B	Any abnormal condition or emergency occurring in the fireroom must be immediately reported to the _____.	oiler on watch	engineer on watch	first assistant engineer	U. S. Coast Guard	
13	549	D	What boiler water chemistry is necessary to ensure the precipitation of hard scale forming calcium?	Hydrazine concentrations should be at the proper level.	Boiler water hardness should be high.	Boiler water should be slightly acidic.	Boiler water should have a reserve of phosphates.	
13	550	D	Prior to lighting a burner in a cold boiler, you should _____.	close the superheater vent	blowdown the mud drum	open the surface blow valve	thoroughly purge the furnace	
13	551	B	The jacking gear on main propulsion turbines can be used to _____.	provide propulsion in emergencies	provide reduction gear tooth inspection	reduce turbine speed during maneuvering	lift the reduction gear casing	
13	552	A	Repeated priming in a steaming boiler can cause damage to the _____.	superheater	desuperheater	economizer	internal feed pipe	
13	553	D	Water is best removed from lubricating oil by _____.	silica gel cartridges	pressure filters	paper edge filters	centrifuging	
13	554	A	Excessive water loss from the main feed system can be caused by _____.	an atmospheric drain tank trap frozen in the closed position	excessive recirculation of condensate from the outlet of the air ejector condenser to the main condenser	a vapor bound main condensate pump	a leak in the desuperheater internal gasket	
13	555	A	With the steam control valve wide open during normal operation, the rate of steam flow from the auxiliary exhaust steam line to the DC heater is actually a function of _____.	rate of condensation in the DC heater	spring pressure of the spray valves	water level in the DC heater reservoir	rate of evaporation in the DC heater	
13	556	B	Water circulation in a water-tube boiler is a result of the _____.	difference between the area and length of the water-tubes	differences in density within the circulated water	velocity added to the water by the feed pump	siphon action of steam leaving the drum	
13	557	B	If a boiler is smoking black, and increasing the excess air does not reduce the smoke, the cause can be _____.	forced draft fan failure	dirty atomizers	heavy soot on tubes	high ambient air temperature	
13	558	B	To safely reduce a high water level in a steaming boiler, you should _____.	use the bottom blow	use the surface blow	secure the boiler fires	open the superheater drain	

13	559	B	The primary difference between sludge and scale deposits in boiler tubes is _____.	scale forms only on the cooler boiler tubes whereas sludge forms on all tubes	scale forms as the result of the crystallization of salts, whereas sludge may consist of reaction products from boiler treatment	sludge is hard and nonadherent at operating temperatures, whereas scale can be deposited at any boiler temperature range	scale is heavier than water and forms in lower drums and headers, whereas sludge is more likely to form along the steam drum waterline	
13	560	B	If the gage glass water level remains constant in a steaming boiler while maneuvering, the most probable cause is a _____.	broken feedwater regulator	restricted gage glass	properly operating feed pump	high water level	
13	561	C	The jacking gear is used in preparation for starting a marine turbine and reduction gear unit to _____.	allow the rotor to cool evenly	allow a film of oil to form on the spring bearings	prevent the gland seal steam from distorting the rotor	listen for rubbing noises from the gland seal condenser	
13	562	A	Severe priming in a boiler can cause damage to the _____.	superheater	steam drum internals	feedwater regulating valve	control desuperheater	
13	563	D	In accordance with Coast Guard Regulations (46 CFR), the normal operating pressure of a water-tube boiler must be stamped on the _____.	burner front	lower header	name plate	drum head	
13	564	C	Which of the following represents one of the most important considerations in the design and location of the boiler internal feed pipe?	Water must be directed toward the downcomers.	Feedwater must be directed to the swash baffles.	Thermal shock to the boiler drum must be avoided.	Holes must be drilled in both the upper and lower portion of the internal feed pipe.	
13	565	C	Zincs are installed in the main and auxiliary condenser waterboxes to _____.	reduce turbulence	prevent air pockets	reduce the effects of electrolysis	prevent scaling	
13	566	D	The possibility of a flareback in a boiler will be reduced if you _____.	rotate the soot blower elements one complete revolution prior to lighting off	maintain the fuel oil to the burner at the flash point	supply a minimum of excess air	purge the furnace with fresh air prior to lighting off	
13	567	D	Boiler stack gas temperature could be higher than normal if _____.	leakage exists in the inner and outer casing	defects exist in the burner cone refractory	fuel oil temperature is excessively high	secondary combustion occurs in the gas passages	
13	568	A	Which ring dam arrangement should be used for centrifugal purification?	The largest inside diameter ring without loss of oil.	The largest outside diameter ring without loss of oil.	The smallest inside diameter ring without loss of oil.	The smallest outside diameter ring without loss of oil.	
13	569	A	Scale prevention in boiler water is accomplished by adding treatment chemicals to _____.	precipitate scale forming salts as sludge	solidify the scale as powder	increase boiler water acidity	cause the water to be neutral	

13	570	B	When a boiler has been secured and is being intially cooled, the water level showing in the steam drum gage glass should be _____.	allowed to drop naturally	maintained at the normal level	maintained at a full glass	allowed to go out of sight	
13	571	B	If steam is admitted to the main propulsion turbine with the jacking gear engaged, which of the following problems can occur?	Uneven warming of the turbine.	Destruction of the jacking gear.	A possibility of shearing the jacking gear flexible coupling.	Excessive tooth stress on the high pressure first reduction pinion.	
13	573	D	High boiler water level can cause carryover and _____.	damage to the economizer	warped screen tubes	warped water wall tubes	damage to the propulsion turbine	
13	574	A	In a boiler, water flows downward in tubes furthest from the fires and flows upward in tubes nearest the fires because _____.	water is denser in the tubes farthest from the fires	water is less dense in the tubes farthest from the fires	tubes farthest from the fires have a greater diameter	tubes farthest from the fires have a smaller diameter	
13	575	C	Air trapped within the main condenser shell is harmful because it will _____.	decrease the turbine exhaust steam temperature	cause the turbine casing to warp and bow	decrease the vacuum in the main condenser	cause heat to be transferred too rapidly	
13	576	A	When an oil purification centrifuge loses a portion of its seal, the oil can then be discharged through the heavy phase discharge port. This is partly a result of greater _____.	centrifugal force being developed on the oil near the interface	centripetal force being developed on the oil near the interface	centrifugal force being developed on the water seal at the side of the bowl	centripetal force being developed on the water seal at the side of the bowl	
13	577	C	In a steaming boiler, higher than normal stack gas temperature can be caused by _____.	low steam demand	excessively high fuel oil temperature	too much excess air	delayed burning due to inadequate excess air	
13	578	D	After restoring the normal water level in a boiler following a high water casualty, you should _____.	immediately put the boiler on the line	reduce the firing rate to the minimum	blowdown the water gage glass	completely drain the superheater	
13	579	D	The most effective way to eliminate sludge from the water drum of a boiler is to _____.	frequently use the surface blow	chemically treat the boiler water	wash the boiler watersides	give the boiler a bottom blow	
13	580	D	The water seal in a centrifuge, operating at normal speed, prevents the lube oil from discharging from the water outlet. Another function of the seal is to _____.	develop permanent emulsions with the lube oil	provide a means of 'washing' the oil as it passes through the bowl	keep the bowl at a temperature below that of the lube oil input	provide an area for separated water to pass and create a path to remove the water from the bowl	
13	581	D	The axial position of a turbine rotor is normally adjusted by varying the thickness of the _____.	thrust bearing shoes	journal bearing shims	labyrinth packing fins	thrust bearing filler piece	
13	582	A	Which of the actions listed should be carried out immediately after securing the fires in one boiler of a two boiler ship?	Relieve all fuel oil service pressure to that boiler.	Open the air registers wide to cool the furnace.	Drain and refill the boiler with cold water.	Secure the main feed pump.	
13	583	C	If the fires to a steaming boiler have been accidently extinguished, you should not relight any burner until _____.	all burning embers in the furnace are extinguished	the furnace refractory has cooled below ignition temperature	the boiler furnace has been thoroughly purged	all fuel has been recirculated from the burners	

13	584	C	During the operation of a lube oil centrifuge, a thin emulsion interface occurs between the lube oil and seal. The position of this interface is determined by the _____.	number of disks in the disk stack	outside diameter of the discharge ring	inside diameter of the ring dam	initial volume of seal water admitted to the bowl	
13	585	B	Which of the condensers listed is cooled by sea water?	Air ejector condenser	Main condenser	Vent condenser	Gland exhaust condenser	
13	586	C	Which of the following statements is true concerning lube oil coolers?	The temperature of the oil is less than that of the cooling water.	The pressure of the oil is less than that of the cooling water.	The pressure of the oil is greater than that of the cooling water.	Magnets are installed in the tube sheets to remove metal particles.	
13	587	A	A higher than normal stack gas temperature could indicate _____.	dirty firesides or watersides	inner or outer casing leakage	eroded water screen tube walls	defects in burner cone refractory	
13	588	C	The original bridge gage reading for a reduction gear bearing was measured as .008 inches. A year later, the bridge gage reading for the same bearing is .010 inches. This indicates _____.	bearing wear is .010 inch	oil clearance is .002 inch	bearing wear is .002 inch	oil clearance has increased .010 inch	
13	589	D	The intermediate pressure bleed steam system, shown in the illustration, is used to supply steam at approximately _____.	35.0 psig	13.6 psig	13.6 psia	67.0 psig	SG-0024
13	591	A	When preparing to get underway and the jacking gear has been disengaged, the main unit should NOT remain stationary for more than 3 to 5 minutes, because _____.	uneven heating from gland seal steam can distort the rotor	the turbine drain lines can fill with condensate	main condenser vacuum will drop rapidly without steam flow through the main unit	with no rotor movement, the journal bearings may overheat due to reduced lube oil flow	
13	592	B	The steam drum air cock is normally opened when cooling down a boiler to _____.	relieve any residual air pressure in the drum	prevent a vacuum forming in the steam drum	reduce the pressure in the drum more rapidly	protect the superheater	
13	593	D	In order to obtain the best performance with a lube oil purifier, the lube oil inlet temperature should _____.	never exceed the highest main engine bearing temperature	be equal to the normal lube oil cooler outlet temperature	never exceed the normal lube oil cooler outlet temperature by more than 55°F	be maintained in a temperature range of 160°F to a maximum of 180°F	
13	594	D	Chamfers, located at the parting edges of horizontal split sleeve type bearings, are used to facilitate oil storage and distribution. They are machined _____.	radially the full length of the bearing	axially the full length of the bearing	radially, to within 45 degrees of the normal bearing surface	axially, approaching but not extending to the end of the bearing	
13	595	A	After the steam leaves the low pressure turbine, it enters the _____.	main condenser	feed and filter tank	first-stage feedwater heater	turbine extraction valve manifold	
13	596	C	To allow for water drum expansion or contraction, the boiler is fitted with _____.	U-bend tubes	expansion joints	sliding feet	spring supported pipe hangers	

13	597	B	If the stack temperature is higher than normal, this could indicate _____.	low fuel oil back pressure	too much excess air	high feedwater pressure	external boiler casing leakage	
13	598	B	The maximum lube oil temperature leaving a large, main propulsion steam turbine bearing should _____.	be 130° F	never exceed 180°F	never exceed the inlet temperature by more than 55°F	not exceed the normal lube oil outlet temperature from the centrifugal purifier	
13	599	D	In a marine boiler, maximum heat transfer rates can be obtained by _____.	maintaining the recommended boiler water pH	treating the boiler water with oxygen scavenging chemicals	maintaining the feedwater temperature 212°F in the economizer	keeping the watersides free from scale deposits	
13	600	D	The illustrated device is designed as a _____.	water and steam seperator	oil and water seperator	liquid eductor	steam whistle	GS-0099
13	601	B	The jacking gear must be engaged as quickly as possible when securing the main turbines in order to _____.	permit rapid cooling of the reduction gears	prevent uneven cooling of the turbine rotors	maintain a constant supply of lube oil to the main unit	prevent the stern tube bearing from overheating	
13	602	D	After a boiler has been taken off the line and is cooling, the air cock is opened to _____.	purge all air from the steam drum	allow even cooling of the steam drum	guard against entrapped gas pockets in the superheater	prevent the formation of a vacuum within the boiler	
13	603	B	Which of the following conditions is true concerning the boiler water drum foundations?	All saddles are a rigid support and are welded directly to the ship's framework.	In a typical installation, the water drum is secured solidly to the ship's foundation on one end and free to move on the other.	Good preventive maintenance practice includes chipping the sliding feet and phosphorous bronze chocks to remove all rust and corrosion to insure free movement.	All of the above.	
13	604	C	The maximum lube oil temperature leaving the lube oil cooler of a main steam turbine propulsion system should _____.	be about 180°F	never be more than 60°F below the lube oil inlet temperature	never exceed 130°F	be dictated only by the existing sea water temperature	
13	605	B	Proper vacuum must be maintained in the main condenser to _____.	run auxiliary machinery	maintain plant efficiency	utilize circulating seawater	cool the lube oil supply	
13	606	D	Item "Q" in the illustration is used to _____.	guide the oil to be cleaned along the inside of the bowl for discharge	balance the force distribution of the three wing device	assist in breaking down surface tension and thereby increase separation of solids and liquids from the oil	establish the position of the three wing within the bowl	GS-0124
13	607	C	Which of the types of superheaters listed has the flattest superheat temperature curve?	Radiant	Convection	Radiant-convection	Conduction-convection	

13	608	D	Carbon deposits in a boiler furnace, as a result of oil impingement, can be caused by _____.	excessive fuel temperature	defective sprayer plates	excessive oil pressure	all of the above	
13	609	A	Chemicals are added to boiler water in order to _____.	reduce oxygen corrosion	reduce the total dissolved solids content	decrease the necessity for blowdowns	eliminate dissolved chlorides	
13	610	A	Before lighting any burner in a cold boiler you should always _____.	purge the furnace with air	open the furnace peephole cover	close off the burner register	reduce the forced draft pressure	
13	611	C	The main propulsion turbine should be operated with the _____.	lowest practical chest pressure and the minimum number of nozzles required to maintain the desired speed	lowest practical chest pressure and the maximum number of nozzles possible to maintain the desired speed	highest practical chest pressure and the minimum number of nozzles required to maintain the desired speed	highest practical chest pressure and the maximum number of nozzles possible to maintain the desired speed	
13	612	A	The internal feed pipe in a D-type marine boiler _____.	distributes feedwater evenly throughout the steam drum	guides the feedwater toward the downcomer tubes	is located well above the normal steam drum water level to assist in deaeration of feedwater	is drilled with holes to provide even distribution of boiler feedwater chemicals	
13	613	C	On an automated vessel steaming at full sea speed, which of the following engine room responses will automatically be actuated by changing the bridge throttle control from full ahead to slow ahead?	Main turbine extraction valves will open.	Scoop injection valve will open.	Condensate recirculating valve will open.	First-stage feedwater heater will be bypassed.	
13	614	C	Burning fuel with entrained saltwater, will cause a glassy slag formation on furnace refractory. This slag will _____.	form a protective coating thus increasing its life	seal refractory joints thereby improving its function	expand at a different rate and result in damaged refractory	increase the furnace efficiency because of reduced firebox turbulence	
13	615	B	While underway, vacuum in the main condenser is primarily caused by the _____.	suction drawn by the condensate pump	condensing of the exhausting steam	main air ejector	aftercondenser loop seal	
13	616	B	The dirty oil inlet on centrifugal lube oil purifiers is located at the _____.	top of the tubular bowl type	bottom of the tubular bowl type	top or bottom of the disk type depending upon whether the unit is to be operated as a separator or clarifier	bottom only of the disk type	
13	617	C	Boiler stack gas temperatures will be higher than normal when _____.	fuel temperature at the burners is excessively high	not enough excess air is being supplied for combustion	secondary combustion is occurring in the gas passages	internal water wall refractory baffles have failed	

13	618	B	What is the quickest way to shutoff the boiler fuel oil supply from inside the fireroom?	Closing the settling tank suction valves.	Trip the quick-closing fuel valve.	Close the double bottom suction valves.	Open the oil recirculating valves.	
13	619	C	Chemicals are added to boiler water to _____.	eliminate the need for blowdowns	stabilize feedwater if a boiler becomes salted up	prevent scale forming deposits	maintain an acidic condition in the feedwater	
13	620	D	To avoid acid corrosion of the economizer tubes when blowing tubes _____.	raise boiler pressure	lower boiler pressure	lower water level	drain the soot blowers headers	
13	621	A	Maintaining low pressure in a condensing turbine exhaust trunk _____.	enables better utilization of available heat energy to perform work	eliminates creep problems in the exhaust trunk during maneuvering	reduces condensate depression with low seawater temperature	prevents steam turbulence in the exhaust trunk due to steam laning	
13	622	D	The maximum, safe, upper limit temperature of lubricating oil discharged from the purifiers is _____.	150°F	160°F	170°F	180°F	
13	623	A	Which of the following methods is used to securely fasten the babbitt lining of a reduction gear bearing to its shell?	The babbitt is centrifugally spun into the bearings or cast under a pressure head.	The babbitt is relieved in way of the split and held in place by locking pins.	The babbitt is securely bonded to the shell by the pressure of the hydrodynamic oil wedge.	The babbitt has a crescent shaped pocket cast symmetrically about the bearing split.	
13	624	C	In a "D" type marine boiler, operating under constant load, which of the following conditions could cause the superheated steam temperature to rise above normal?	High feedwater temperature	Insufficient combustion air	Low feedwater temperature	DFT excessive vapor pressure	
13	625	C	In which of the following types of condensers would you find the cooling water passing through tubes with the turbogenerator exhaust steam directed around the outside of the tubes?	Jet	Barometric	Surface	Collins	
13	626	B	A poorly cleaned lube oil purifier bowl may result in _____.	insufficient oil supply to the gravity tank	improper separation	excessive lube oil consumption	excessive water discharge rate	
13	627	B	Low stack gas temperatures should be avoided in order to reduce the _____.	percentage of carbon monoxide in the stack gas	formation of sulfuric acid	heat loss through the uptakes	accumulation of soot	
13	628	A	You can secure the fuel supply to the boilers from outside the fireroom by _____.	operating the remote shutoff	operating the double bottom sluice valves with the reach rod	closing the master oil valve with the reach rod	closing the oil recirculating valve with the remote control	
13	629	C	The end products of reactions occurring when boiler water is chemically treated, remain in the boiler and increase the need for _____.	makeup feed	acid cleaning	boiler blowdown	waterside corrosion treatment	
13	630	B	Water removed through centrifugal force in the illustrated unit is displaced from the bowl through _____.	K	N	V	X	GS-0124

13	631	D	Proper vacuum must be maintained during prolonged astern operation to _____.	eliminate leaving loss in the ahead blading	minimize any appreciable amount of condensate depression	ensure proper action of the condenser sentinel valve or back pressure trip	prevent overheating of the ahead blading	
13	632	B	While raising steam on a cold boiler, the air cock is to be closed after _____.	the boiler is cut in on the line	steam has formed and all air is vented	the economizer drain is closed	all burners have been lit and firing normally	
13	633	A	Which of the following statements is true regarding lube oil coolers used for main steam propulsion systems?	Regulating the inlet water flow to a lube oil cooler may result in air binding of the water side.	A lube oil cooler is typically constructed as a cross-flow type heat exchanger.	If an automatically controlled bypass valve controls the lube oil temperature, it will be used to regulate the lube oil flow out of the cooler.	The lube oil usually flows thru the tubes and the cooling water around the tubes.	
13	634	A	The term 'separation' as used in oil purification refers to the removal of _____.	two liquids from each other	solids from lube oil	acid contaminants from oil	oil from its additives	
13	635	B	A main condenser utilizing a scoop for the circulation of seawater must be constructed as a _____.	two-pass heat exchanger	single-pass heat exchanger	counterflow heat exchanger	parallel flow heat exchanger	
13	636	A	Under normal firing rates, a reduction of the steam outlet temperature from an uncontrolled superheater could be caused by _____.	high feedwater temperature	too much excess air	dirty generating tubes	fouled economizer tubes	
13	637	B	Low stack gas temperature should be avoided to reduce _____.	economizer thermal stress	sulfuric acid formation	back pressure in the uptakes	air heater thermal stress	
13	638	C	All fuel oil service pumps are equipped with a _____.	relief valve on the suction side	combustion control valve on the discharge side	remote means of stopping the pump	direct suction to the double bottom tanks	
13	639	B	One of the purposes of chemically treating boiler water is to _____.	reduce blowdown frequency	reduce scale formation	eliminate waterside cleaning	constantly decrease alkalinity	
13	640	C	Sound is produced by the illustrated device by the _____.	vertical virbrating movement of "E"	high speed rotation of "B"	rapid oscilation of "B"	rapid input of steam or air through "I"	GS-0099
13	641	C	Why is it important to maintain good vacuum in a main turbine unit while operating astern?	Reduces windage loss in the astern section.	Prevents the ahead element from operating backwards.	Maintains proper temperatures in the ahead stage.	Limits the amount of time necessary to operate astern.	
13	642	D	The purpose of the boiler drum air cock is to _____.	admit air when the boiler is being emptied	permit escape of air when the boiler is being filled	permit escape of air when steam is forming in the drum after lighting off	all of the above	

13	643	B	Which of the following statements concerning the operation of a lube oil purifier is correct?	They should be operated as clarifiers for optimum moisture removal.	They should be operated at maximum design speed and recommended operating capacity.	They should be operated as slowly as possible to ensure a long service life.	They should not be primed with water when operated as a separator.		
13	644	C	In order to maintain the required lube oil temperature leaving a lube oil cooler, where an automatic bypass valve is not provided, which of the following operations is correct?	The cooling water to the lube oil cooler is directly regulated to maintain the proper lube oil temperature.	The lube oil velocity to the cooler is regulated.	The cooling water flow rate leaving the cooler is directly regulated.	The lube oil velocity from the cooler is regulated.		
13	645	B	Excessive soot deposits on the heating surfaces of a boiler uncontrolled interdeck superheater would be indicated by _____.	decreased fuel oil and air requirements	increased stack temperature	increased desuperheated steam temperature	increased superheater outlet temperature		
13	646	D	Lube oil is preheated before centrifuging in order to _____.	boil off water	prevent corrosion	reduce friction of the rotating components of the centrifuge	improve purification		
13	647	A	Which of the following represents the proper color of the flame farthest from an atomizer during normal operations?	Bright yellow or orange	Dark brown	Light brown haze	Dazzling white		
13	648	D	The relief valve on the discharge side of the fuel oil service pump may discharge directly to the suction side of the pump, or to the _____.	fuel oil heater inlet	oil header return line	double bottom fuel tank	fuel oil settling tank		
13	649	D	What is the purpose of chemically treating boiler water?	To reduce formation of scale on the waterside of the boiler.	To reduce to a minimum corrosion of boiler metal.	To reduce foaming and moisture carryover.	All of the above.		
13	650	D	Which of the following would contribute to the formation of an oil and water emulsion, in addition to acid formation?	Aeration, agitation, and heat	Solid insoluble particles, aeration, and heat	Water and solid insoluble particles	Water, agitation, and heat		
13	651	A	The FIRST step in breaking vacuum on a main turbine unit should be to _____.	secure the steam to the main air ejector	secure the steam to the gland seal system	stop the main circulating pump	stop the main condensate pump		
13	652	A	Which of the following is the best reason for opening the air cock when draining a water-tube boiler?	With the air cock open, the boiler drains without producing a vacuum.	Water flows out of the boiler too rapidly with the air cock closed.	Air mixed with the water will create a cleansing effect in the tubes.	Air coming into the boiler will help dry out the boiler's surface.		

13	653	C	The peeling of boiler refractory associated with slagging, is caused by the _____.	shrinkage of brickwork adjacent to slag coated refractory	chemical action of the slag on the firebrick surface	difference in the rate of expansion between the firebrick and slag coating	uneven heating of the brickwork during boiler warm up	
13	654	D	The purpose of the cam-actuated steam valve used in a boiler soot blower system, is to _____.	rotate the element through a predetermined blowing arc	automatically blow the elements in the proper sequence	automatically secure steam to the blower head any time the element stops turning	prevent steam from entering the soot blower when the element holes are directed toward the refractory	
13	655	D	If the pressure becomes excessive in the auxiliary exhaust system, the excess steam will be dumped to the _____.	deaerating feed tank	vent condenser	reduced steam system	main condenser	
13	656	B	A cause of high superheater outlet temperature is _____,	high feedwater temperature	low feedwater temperature	excessive fuel oil temperature at the settlers	insufficient excess air	
13	657	D	Which color burner flame would indicate too much excess air?	Orange red	Yellowish orange	Bright red	Incandescent white	
13	658	B	The relief valve on the discharge side of the fuel oil service pump may discharge directly to the settler, or to the _____.	fuel oil heater inlet	suction side of the pump	oil header return line	double bottom fuel tank	
13	659	C	An increase in the concentration of total dissolved solids in boiler water can result from _____.	zero water hardness	dissolved oxygen deaeration	routine treatment with phosphates	frequent prolonged surface blows	
13	660	D	A centrifuge will satisfactorily remove which of the listed substances from lube oil?	Diesel fuel	Gasoline	Fuel oil	Carbon particles	
13	661	D	To raise vacuum on the main turbine unit, you should _____.	start the lube oil pump after starting the jacking gear	warm up and drain the main steam lines	pump the main condenser hotwell dry	admit gland sealing steam to the turbine glands	
13	662	D	A nozzle reaction safety valve will lift at a pressure lower than required if the _____.	adjusting ring is set too low	blowdown is set too low	nozzle ring has come adrift	spring compression is insufficient	
13	663	C	Under otherwise normal operating conditions, a drop in the steam temperature leaving an uncontrolled interdeck-type superheater could be caused by a/an _____.	increase in combustion gas velocity through the superheater	decrease in steam velocity through the superheater	increase in feedwater temperature	badly fouled economizer	
13	664	C	In a tubular-bowl type centrifugal lube oil purifier, any solids separated from the oil are _____.	discharged with the water	removed through the waste drain	retained in the bowl	solidified on the upper cover	

13	665	B	In a closed feed and water cycle, which of the conditions listed could prevent vacuum from reaching the desired level?	Steam leaking from the turbine glands.	Marine growth on the cooling water side of the main condenser.	Condensate recirculating back to the condenser during maneuvering.	Steam pressure to air ejectors maintained at 10 psig above designed supply pressure.	
13	666	D	Coast Guard Regulations (46 CFR) require unfired pressure vessels with manholes to be hydrostatically tested _____.	every 4 years	every 8 years	at each certification inspection	at the discretion of the marine inspector	
13	667	D	An incandescent white flame in a boiler firebox would indicate _____.	efficient combustion	low fuel oil temperature	excessive fuel oil pressure	too much excess air	
13	668	D	The recirculating valve provided in a straight mechanical boiler fuel oil service system, should be opened when _____.	going into maneuvering conditions	the service pump relief valve lifts	bypassing one bank of fuel oil heaters	preparing to light off a cold boiler	
13	669	A	An adequate phosphate reserve should be maintained in boiler water to _____.	prevent hard scale formation	reduce the blowdown frequency	maintain a pH of 7	remove dissolved oxygen concentrations	
13	670	A	Main steam turbine bearings are lined with _____.	babbitt	steel	cast-iron	ferrous oxide	
13	671	A	Raising vacuum on a main turbine unit without using the turning gear will result in _____.	uneven heat distribution in the rotor unit	excessive time being required to raise vacuum	scoring of the rotor in way of the labyrinth packing	overheating of the second-stage air ejector	
13	672	D	Babbitt is a metal alloy commonly used for lining _____.	saltwater piping	valve seats	shim stock	precision bearings	
13	673	B	Heated lube oil will begin to break down if mixed with water and _____.	allowed to stand idle	is thoroughly agitated	thoroughly centrifuged	discharged through a finite filter	
13	674	C	Under normal operating conditions, a drop in the steam temperature at the outlet of an interdeck superheater could be caused by a decrease in _____.	steam velocity through the superheater	the feedwater temperature	combustion gas velocity through the superheater	the pressure differential across the fuel oil strainers	
13	675	B	Waterboxes on condensers are vented to _____.	prevent excessive pressure on tube sheets	liberate air bubbles and reduce waterside oxidation	assure positive flow to the lube oil coolers	prevent vapor binding of the circulating pump	
13	676	B	In order to determine the effectiveness of the lube oil centrifuge in removing water, the engineer in charge should _____.	have the centrifuge cleaned only once every 30 days	take lube oil samples each week and place in clear containers for inspection	maintain the lube oil input at a maximum of 155°F	maintain the rotating speed of a disk-type bowl at 15,000 RPM	
13	677	A	If an analysis of boiler flue gas determines there is 50% excess air for combustion, you should expect the nitrogen content of the flue gas to be approximately _____.	79.00%	33.00%	21.00%	14.00%	

13	678	B	Steam assist fuel atomizers are converted to straight mechanical atomizers in order to _____.	raise steam on the idle boiler	cold start a boiler with diesel oil	meet minimum boiler steam demands	provide the best fuel economy	
13	679	B	Phosphates are used in the chemical treatment of boiler water to _____.	control alkalinity and neutralize vanadium	convert scale forming salts to relatively harmless sludges	neutralize the harmful effects of hydrogen embrittlement	decrease dissolved oxygen content	
13	680	D	A lube oil sample taken from the main engine lube oil system has a dark yellow opaque color. This is the result of _____ .	water contamination	mixing oils of two widely different viscosities	overheating	aeration	
13	681	B	Prolonged astern operation of a turbine will cause _____.	overheating of the stern gland	overheating of the ahead stages	improper functioning of the air ejectors	loss of suction at the condensate pump	
13	682	B	The primary operational difference between a huddling chamber type safety valve and a nozzle reaction type safety valve is the _____.	manner in which steam pressure causes initial valve opening	principle by which blowdown is accomplished	difference in valve relieving capacities	manner in which lifting pressure is adjusted	
13	683	D	Which of the following statements is correct regarding the selection of the proper size ring dam for a tubular-type lube oil purifier?	The size ring dam used depends on the viscosity of the oil being purified.	While all ring dams have the same inside diameter, the outside diameters vary.	Ring dams of larger sizes are indicated by smaller numbers.	Satisfactory purification is obtained when the ring dam is the largest size possible, and no oil is present at the water discharge.	
13	684	A	A lube oil sample is taken from the main engine lube oil system and visually inspected. Which of the following would indicate water contamination?	A milky-white color	A clear, amber color	A black color	A reddish-orange color	
13	685	C	When main condenser tubes are rolled into both tube sheets, the effects due to differential expansion rates are minimized by the use of _____.	a bellows tube sheet	condenser supports	shell expansion joints	a brass wearing strip	
13	686	A	Under normal firing rates, which of the conditions listed could result in a low superheater outlet temperature?	High feedwater temperature	Too much excess air	Dirty generating tubes	Fouled economizer tubes	
13	687	D	If an analysis of boiler flue gas determines there is no excess air for combustion, you should expect the nitrogen content of the flue gas to be approximately _____.	10.50%	14.00%	21.00%	79.00%	
13	688	D	In a disk-type purifier which component is used to separate lube oil into thin layers and create shallow settling distances?	A discharge ring	A three-wing device	A tubular bowl	A series of cone-shaped plates	
13	689	A	Boiler water hardness in modern high pressure boilers should be kept as close to 'zero' as possible by chemically treating with _____.	trisodium phosphate	soda ash	caustic soda	all of the above	

13	690	C	A sudden unexplainable drop has occurred in the outlet temperature of an uncontrolled interdeck superheater on a boiler carrying a higher than normal TDS (total dissolved solids) reading. Which of the actions listed is required?	Immediate increase in the firing rate.	Reduction in the forced draft fan speed.	Lowering the steam drum water level.	Raising the feedwater temperature.	
13	691	B	The purpose of the sentinel valve installed on a turbine casing is to _____.	warn the engineer of back flow of steam from the exhaust trunk	warn the engineer of excessive pressure in the low pressure turbine casing	relieve excess pressure to the turbine extraction points	vent excess steam to the main condenser	
13	692	A	What is the primary operational difference between a nozzle reaction safety valve and a huddling chamber safety valve?	The principle by which blowdown is accomplished.	The manner in which steam pressure causes initial valve opening.	The difference in valve relieving capacities.	The manner in which lifting pressure is adjusted.	
13	693	D	In a disk type lube oil purifier, heavy impurities collect mostly _____.	at the bottom of the unit	along the center shaft	at the water discharge	on the inside surfaces of the bowl	
13	694	A	The lube oil coolers installed in a gravity lubricating oil system are located between the _____.	lube oil pumps and gravity tanks	gravity tanks and main units	gravity tanks and lube oil sump	lube oil sump and lube oil pumps	
13	695	D	The recommended vacuum should be maintained in the main condenser to _____.	condense turbine exhaust steam	recover latent heat from turbine exhaust steam	recover sensible heat from turbine exhaust steam	utilize the greatest possible amount of energy	
13	696	B	What type of lube oil cooler is shown in the illustration?	Self venting	Shell-and-tube	Bundle and stack	Evaporative	GS-0122
13	697	C	If an analysis of boiler flue gas determines there is 100% excess air for combustion, you should expect the flue gas to have a nitrogen content of approximately _____.	21.00%	33.00%	79.00%	87.00%	
13	698	A	Which of the fuel atomizers listed has the greatest firing range or turndown ratio?	Steam assist	Rotary cup	Return flow	Straight-through flow	
13	699	B	In the prevention of moisture carryover from a marine boiler, one important consideration is to _____.	properly treat the boiler water with hydrazine	control the amount of boiler water solids	maintain a high boiler water level	add foaming agents to the boiler water	
13	700	C	The items labeled "A" in the illustration are the _____.	low pressure drain connections	high pressure drain connections	low pressure vent connections	low pressure steam supply connections	SG-0025
13	701	B	The sentinel valve located on the low pressure turbine casing is designed to _____.	bypass exhaust steam to the main condenser	warn the engineer of excessive pressure in the L.P. casing	control steam flow to the LP unit	relieve excess pressure when the astern throttle is opened	

13	702	A	When excessive static boiler pressure has resulted in the initial lift of the valve disc, a huddling chamber safety valve will continue to lift open as a result of _____,	steam pressure acting on the enlarged area of projecting lip or ring	the resulting reactive force created by the rapid expansion of escaping steam	an increase in steam velocity through an adjustable orifice ring	steam pressure transmitted through a pipe connected to the superheater outlet	
13	703	D	While standing your engine room watch at sea, you notice the D.C. heater level dropping rapidly as indicated by the remote level indicator. Which of the following actions should be taken?	Immediately stop the main engine.	Do nothing in particular as this is a common occurrence aboard this vessel.	It is only necessary to immediately open the automatic make-up feed bypass valve.	Open the make-up feed valve bypass and check the condenser level immediately.	
13	704	A	Prior to relieving the watch you should first check the fireroom status by verifying the boiler steam drum level and _____.	inspecting the fires and burners	preparing to blow tubes	stack temperature	port and starboard settling tank levels	
13	705	A	One of the basic rules applying to the operation of a single-pass main condenser, is that the _____.	cooling water overboard should be about 10°F higher than the inlet temperature	vacuum must be maintained at 29.92" of Hg. under all operating conditions	quantity of reheating steam flow through the condenser must be maintained at maximum under all operating conditions	condensate temperature must never be allowed to drop below 104°F	
13	706	D	While trying to light off a burner on a semi-automated boiler, you note that the fuel oil solenoid valve at the burner will not stay open. Which of the following conditions could cause this problem?	The fuel oil pressure at that burner is too high.	The flame scanner is adjusted for excessive time delay in the ignition trial circuit.	The solenoid coil is energized causing the valve to remain closed.	The forced draft air supply has failed.	
13	707	B	A flue gas analysis is performed to determine the _____.	percentage of nitrogen by volume	correct fuel/air ratio for efficient combustion	carbon content of the fuel being burned	specific heat of combustion products	
13	708	A	An advantage of steam atomization compared to mechanical atomization is _____.	its greater turndown ratio	improved heat transfer in the boiler	the ability of the system to maintain the proper ratio of fuel and air at all rates of combustion	bleed steam is utilized thereby increasing plant efficiency	
13	709	A	Carryover in a marine boiler can be caused by _____.	boiler water contaminants	low boiler water alkalinity	a high concentration of hydrazine in the boiler water	overfiring the boiler to the end point of combustion	
13	710	B	If contaminated lube oil were allowed to settle undisturbed in a tank, into which layers would the contaminants separate?	Sediment on the bottom, oil in the middle, and water on top.	Sediment on the bottom, water in the middle, and oil on top.	Water on the bottom, oil in the middle, and sediment on top.	Water on the bottom, sediment in the middle, and oil on top.	

13	711	A	The purpose of shroud bands secured to the tips of the turbine blades is to _____.	stiffen the blades to reduce vibration	increase blade resistance to moisture in steam	assist in maintaining radial clearances	strengthen the blade root fastenings	
13	712	A	In a huddling chamber type safety valve, initial valve opening is caused by static pressure acting on the _____.	valve disk	nozzle ring	adjusting ring	compression screw	
13	713	C	To determine the extent of lube oil system contamination you would _____.	watch for variations in the lube oil pump discharge pressure	observe the oil flow in the sight glasses	inspect the purifier for separated foreign matter	maintain a close watch on bearing temperatures	
13	714	C	Which of the following types of bearing lubrication schemes can carry the highest unit loading?	Ring lubricated	Disk lubricated	Pressure lubricated	Oil whip lubricated	
13	715	D	While making a round of the engine room, the oil in all of the main engine bearing sight glasses appears to be milky. The probable cause is _____.	cold running of the bearing	collapse of the oil wedge	air leakage into the bearing	water contamination of the lube oil	
13	716	C	Which of the following would cause the dowel or locking lip of a split-type, precision insert, main bearing to shear and allow the bearing to rotate with the journal?	Unequal torque to any two adjacent bearing bolts	Excessive bearing bolt torque	Insufficient bearing crush	Short periods of above normal operating speeds	
13	717	D	A chemical based analysis of boiler stack gases is taken to _____.	determine the volume of the SO2 products of combustion	estimate the amount of noncombustible solids present in fuel oil	estimate the BTU content of a quantity of fuel oil	measure the percentage volume of CO2	
13	718	C	While at sea, during your watch in the engine room of a steam turbine driven vessel, you notice the main lube oil pump suction strainer vacuum differential has been increasing. To correct this you should _____.	open drain line prior to changing over strainers to decrease vacuum differential	back flush the strainer baskets	stop the main engine prior to removing the lube oil suction strainer covers, if simply changing over strainers has not proved satisfactory	rotate the knife edge cleaning device	
13	719	D	If boiler water chemicals are decreasing in one boiler and increasing in the other boiler, while both are steaming at normal rates, a leak probably exists in the _____.	economizer tubes	superheater tubes	feedwater crossover line	internal desuperheater flange	
13	720	B	The most practical method of determining the condition of a shaft bearing while the shaft is in operation is to _____.	visually inspect the bearing	check the lube oil temperature	check the lube oil viscosity	perform a carbon blot test on an oil sample from the bearing	
13	721	B	Steam supplied to the main propulsion turbines is _____.	saturated steam	superheated steam	desuperheated steam	wet steam	

13	722	D	In a huddling chamber safety valve, the initial valve opening is caused by _____.	static pressure acting on the compression screw	steam pressure acting on the increased surface area of the projecting feather	steam flow passing through the calibrated adjusting ring	steam pressure acting on the exposed bottom area of the valve disk	
13	723	B	During the routine inspection of an operating centrifugal lube oil purifier, you notice oil discharging through the water discharge port. Which of the following actions should be taken?	Do nothing as this is normal.	Add water to seal the bowl.	Increase the bowl speed to balance the water and oil discharges.	Decrease the temperature of the entering oil to lower the specific gravity.	
13	724	C	One limiting problem of lube oil filters restricting their use in large lube oil systems is _____.	they easily rupture at normal working pressures	as the oil temperature fluctuates during load changes their effectiveness changes inversely to the temperature	the associated large pressure drop across the filter	the need to centrifuge the oil in addition to the use of the filter	
13	725	B	A condensate recirculating line is provided to the main condenser in a closed feedwater system to _____.	prevent excessively cooled distillate from entering the DC heater	provide adequate cooling water to the air ejector inter and after condensers	assure a positive flow through the main feed pump	prevent flashing in the main feed pump	
13	726	C	In a tubular bowl centrifugal purifier, lube oil is rotated at the same speed as the bowl by the _____.	ring dam	bowl boss	three-wing device	flexible spindle	
13	727	D	Which of the stack emissions listed represents a heat loss from the furnace?	Nitrogen	Excess air	Superheated water vapor	All of the above are correct.	
13	728	D	Boilers equipped with steam atomizers can operate over a wide load range without cutting burners in and out because _____.	steam maintains the oil at the fire point temperature	atomizing steam pressure is held constant for all load ranges	it is not necessary to regulate fuel oil pressure at the burners with this system	steam velocity aids in the atomizing of fuel oil over a wide range of fuel pressures	
13	729	B	The unit shown in the illustration is used as the _____.	high pressure feed heater	combined low pressure feed heater	butterworth feed heater	flash evaporator salt water feed heater	SG-0025
13	730	D	The vessel is currently operating at sea. Despite troubleshooting the system, the engineers of the vessel have been unable to transfer fuel to the settler. As the settler level is becoming dangerously low, they should now _____.	repeat all the steps they have taken	call out all hands for assistance	utilize a rubber impeller portable pump	reduce the vessel's speed and other plant loads	
13	731	D	Which of the steam losses listed would be associated with a multistage impulse turbine rather than a multistage reaction turbine?	Radiation loss	Leaving loss	Blade and nozzle loss	Diaphragm packing loss	

13	732	B	Why is it occasionally necessary to verify the accuracy of the distilled water make-up feed tank level remote indicator?	It is possible to loose vacuum if the level rises above the make-up feed piping connection.	A false high reading may contribute to an increase in condenser absolute pressure.	The tank may overflow in the engine space causing unnecessary damage to all electrical equipment.	All of the above are correct.	
13	733	D	While standing your engine room watch at sea, you notice the D.C. heater level is dropping below normal as indicated by the remote level indicator. The boiler drum level is observed to be normal, as is the main condensate pump discharge pressure. Therefore, you should _____.	increase the boiler firing rates	decrease the boiler firing rates	reduce the feedwater level set point	open the make-up feed bypass valve	
13	734	D	While on watch aboard a 900 psi steam vessel, you suddenly hear a loud, piercing, high-pitched noise. Which of the following actions should you take?	Vacate everyone from the engine room immediately, as this is the preliminary signal that the steam smothering system is about to be released.	Rapidly move towards the direction of the noise to investigate the probable source.	Cautiously move towards the source of the noise, sweeping the beam of your flash light ahead of you.	Move away from the noise to find a broom, then cautiously advance, sweeping the handle ahead of you to locate the source.	
13	735	C	Which steam plant watch operating condition will require priority attention over the other conditions listed?	High level main condenser	High level lube oil storage tank	Low water level main boiler	Deareating tank pressure 2 psig above normal	
13	736	B	The terms 'swell' and 'shrink' relate to a change in boiler water level which _____.	results when the feed rate becomes erratic during maneuvering	is due to the volumetric change in the size of the steam bubbles below the water surface	result in a rapid change in fuel oil viscosity	indicates a high chloride concentration in the boiler water	
13	737	B	Which of the flue gas components listed contributes to the greatest heat loss in a boiler?	Carbon monoxide	Nitrogen	Carbon dioxide	Superheated water vapor	
13	738	B	Boilers equipped with steam atomized burners can be operated without changing burner tips because steam atomization _____.	maintains the oil at ignition temperature	finely atomizes fuel oil over a band of fuel oil system pressures	automatically cleans the burner tips and eliminates fouling	regulates itself by responding to the position of the main engine throttles	
13	739	C	The inability to maintain proper boiler water alkalinity, phosphate, or pH levels in a steam boiler, indicates a leak in the _____.	economizer drain line	DC heater	desuperheater	superheater drain line	

13	740	D	Upon taking over the watch while vessel is operating at sea speed you find the D.C. heater level to be dropping slowly. Which components should be checked immediately?	Auxiliary condenser recirculation valve. Failure to properly set may prevent proper flow through the condensate line.	Makeup feed valve. Improper operation may prohibit the necessary addition of distilled water to the system.	D.C. heater spill valve. If this valve, or its bypass is opened, large amounts of water may be directed to the distilled water tank.	All of the above are correct and together provide the necessary means to control the water levels throughout the condensate and feedwater systems.	
13	741	D	In comparison to a reaction turbine, a steam loss specific to an impulse turbine is known as _____.	radiation loss	leaving loss	blade and nozzle loss	diaphragm packing loss	
13	742	B	The function of a safety valve on a marine boiler is to prevent the pressure in the boiler from rising above _____.	design test pressure	maximum allowable working pressure	the pressure used in the accumulation test	the hydrostatic test pressure	
13	743	B	The term 'swell' relates to a change in boiler water level which _____.	results when the feed rate becomes erratic during maneuvering	is due to the steam bubbles below the surface occupying a larger volume	is due to a rapid change of steam temperature during maneuvering operations	indicates a high chloride concentration in the boiler water	
13	744	C	Upon assuming the in port watch of a tank vessel while cargo operations are in progress, with the main engine and reduction gear secured you notice a substantial rise in the reduction gear lube oil sump level. Which components or conditions should be checked immediately?	Inspect proper line-up of lube oil service pump bypass system.	Confirm with the deck officer that there has been a change in the vessel's trim.	Verify that there is no rotation of the propulsion equipment and the gravity tank is empty.	All of the above are correct.	
13	745	D	Which of the listed parts shown,in the illustration of the turbogenerator governing system, provides the follow-up motion to prevent the nozzle valves from cycling between the fully open and fully closed positions with each variation in turbine speed?	Synchronizer	Operating cylinder	Main speed governor	Restoring linkage	SE-0009
13	746	C	Slag caused by water in the fuel oil will _____.	form a protective coating thus increasing its life	seal refractory joints thereby improving its function	expand at a different rate and result in damaged refractory	increase the furnace efficiency because of reduced firebox turbulence	
13	747	C	A high carbon monoxide content in the flue gases of a boiler indicates _____.	complete combustion	too much excess air	incomplete combustion	a high carbon content fuel	
13	748	B	In most installations, the firing rate of a boiler using steam atomization is indicated by the _____.	burner register opening	fuel oil supply pressure	fuel oil return pressure	steam atomization temperature	

13	749	C	While your vessel is steaming at a constant rate, the alkalinity of the boiler water is decreasing steadily without requiring the use of extra makeup feedwater. This condition could be caused by a leak in the _____.	economizer	condenser	desuperheater	superheater	
13	750	B	The property of a fuel oil which is a measurement of its available energy, is known as its _____.	cetane number	heating value	carbon number	cetane index	
13	751	A	In securing the main turbines, steam to the second stage air ejectors should be left on for a while in order to _____.	dry out the main turbines	insure equal cooling of the main turbine bearings	prevent excessive condensate depression	remove the excessive amount of noncondensable vapors which accumulated during maneuvering operations	
13	752	B	A boiler safety valve must be capable of _____.	remaining open until all pressure in the steam drum is relieved	remaining open until a preset pressure drop occurs	opening gradually above a designated pressure	closing with a chattering motion to free scale deposits from the seats	
13	753	B	Lube oil cannot be efficiently filtered if its _____.	viscosity index is too low	temperature is too low	pump discharge pressure is higher than the system pressure	pump capacity is greater than the system's needs	
13	754	C	What will occur if the level of the atmospheric drain tank, (fresh water drain collector) is permitted to continuously rise while the vessel is underway?	The tank will overflow causing a significant loss of potable water.	The pressure of the contaminated steam system will rise when the tank becomes full.	There is a definite possibility of the tank overflowing, causing loss of distilled water.	There will be an increase of vacuum in the main condensor within a short period of time.	
13	755	B	Despite troubleshooting the system, the watch engineer has been unable to transfer fuel to the settler while underway. As the settler level is becoming dangerously low, the engineer should now _____.	repeat all the steps he has taken	call out other engineers for assistance	utilize a portable rubber impeller transfer pump	secure each propulsion boiler	
13	756	A	The purpose of the relief valve in a fuel oil service system is to _____.	protect the system from high discharge pressure	regulate the atomizer oil pressure	control the oil pressure regulators	supply constant pressure to the burner combustion control valves	
13	757	D	A high percentage of carbon dioxide in boiler flue gases indicates _____.	carbonized burner tips	too much excess air	contaminated fuel oil	nearly complete combustion of fuel oil	

13	758	C	With an increase in the saturation pressure of a fluid, the value represented by line "5" on the graph will _____.	decrease the number of BTU's per pound per change in degree of temperature	increase the number of BTU's per pound, per change in degree of temperature	remain virtually the same	represent an increase in the latent heat of condensation	SG-0001
13	759	C	A basic comparison can be made between a low pressure evaporator operation and a main condenser with regards to the removal of noncondensable gases. The vacuum drag line for the main condenser is specifically connected in which area?	main tube bank	steam lane	air cooler section	hotwell	
13	760	B	The purpose of the pressure control disk installed in the soot blower illustrated is to _____.	control the velocity and distance of the steam valve passing from the soot blower element	reduce the steam supply pressure to properly rotate the soot blower	control the amount of arc during rotation of the soot blower element	assist in the intial opening of the valve at the begining of the soot blower operation	
13	761	B	For a period of time immediately after being secured, turbines should be rotated slowly to avoid _____.	damage to the reduction gear teeth	distortion of the rotor shaft	excessive strain on the quill shaft flexible coupling	seizure of the main bearing	
13	762	B	A boiler accumulation test is used to measure the _____.	lifting pressure of the boiler safety valves	total relieving capacity of the boiler safety valves	steam generating capacity of the boiler	blowdown pressure of the boiler	
13	763	C	The steam soot blower piping should be thoroughly drained before operating to prevent _____.	accidental flameout	feedwater losses	nozzle/elements eroding	erosion of the corbel	
13	764	D	The level of the contaminated drain inspection tank continually decreases when steam is admitted to a fuel oil double bottom tank. You can expect _____.	insufficient heating in the tank	higher than normal return temperatures	a leaking makeup feed regulator	a perforated heating coil	
13	765	D	The function of item "E" shown in the illustration is to _____.	pulse supply steam or air to chamber "M"	allow steam/condensate or air to be evacuated from the unit as sound is produced	act as a reed to enable the production of sound	control the admission of steam into chamber "M" as part of the process to produce sound	GS-0099
13	766	C	The best indication that a bearing is being properly lubricated is by the _____.	oil pressure at the lube oil pump discharge	lube oil strainer condition during cleaning and inspection	oil temperature indicated by the bearing thermometer	oil temperature leaving the lube oil cooler	
13	767	A	If the flue gas oxygen content is too high, you should _____.	adjust the combustion control system	adjust the fuel oil service system	increase the forced draft fan speed	increase the fuel oil temperature	
13	768	B	The firing range of a steam assisted fuel atomizer is regulated to cope with changes in the steam demand by varying the _____.	fuel oil return pressure	fuel oil supply pressure	steam atomization temperature	shape of the atomized fuel cone	

13	769	D	Which steam plant watch operating condition will require priority attention over the other conditions listed?	High level hydrazine dosing tank	High level lube oil storage tank	Low sewage tank chlorination section level	Low lube oil level in the operating feed pump	
13	770	B	Oil discharged from the illustrated device has a milky-white appearance which is due to _____.	proper operation of the centrifuge	insufficient tension being maintained by "H"	excessive tension provided by "Q"	slightly worn item "V"	GS-0124
13	771	B	In a reaction turbine, the fixed blades function to _____.	decrease steam velocity	increase steam velocity	prevent turbulence	produce turbulence	
13	772	B	Which of the conditions listed will provide 'blowdown' after the safety valve has lifted?	The valve is held open by a pressure pilot line.	Once the valve has opened, the existing steam pressure acts on an enlarged area creating an opening force greater than that which opened the valve.	Once the valve lifts, the set opening pressure changes.	The safety valve opens gradually but with decreasing lift during the blowdown period.	
13	773	B	In accordance with Coast Guard Regulations (46 CFR), all vessels having oil fired main propulsion boiler(s) must be equipped with _____.	only one positive displacement type fuel service pump	duplex strainers, each for suction and discharge	one fuel oil heater if shown that the normally used fuel oil will be of low viscosity	all of the above	
13	774	C	The three wing device in the unit illustrated is maintained in its position by item _____.	O	P	Q	R	GS-0124
13	775	D	In the illustrated device, what would be a reason for oil being discharged from port "N" ?	The device being operated as a clarifier.	The ring dam size is too small.	This would be normal for the operation.	The ring dam size is too large.	GS-0124
13	777	C	Which of the following items should be checked each time the firing rate or forced draft pressure is adjusted?	Fuel oil heater inlet temperature	Atomizing steam pressure	Smoke periscope	Fuel oil suction pressure	
13	778	A	The amount of fuel oil atomized by a steam atomization burner depends on the atomizing steam pressure, the fuel pressure and the _____.	sprayer plate size	oil return pressure	furnace air pressure	windbox pressure	
13	779	A	Oil accumulation in boiler water would _____.	cause foaming and carryover from the boiler	increase the heat transfer rate	prevent acid attack on the boiler tubes	practically eliminate boiler sludge formation	
13	780	D	Which steam plant watch operating condition will require priority attention over the other situations listed?	Low level in lube oil sludge tank	High level in lube oil in storage tank	Low level effluent in chlorination section of sewage tank	High bilge water level throughout engineroom	

13	781	A	As found in a reduction gear drive system, thrust bearings serve to _____.	transmit the force produced by the propeller to the structure of the ship	limit the radial movement of the shaft	increase the shaft speed	hold the main engine in place	
13	782	B	Proper bracing and support of the boiler safety valve escape piping is necessary to _____.	prevent condensate from accumulating in lines	prevent stressing of the safety valves	allow for back pressure formation in the line	prevent scale from lodging on the valve seat	
13	783	C	The ability of the device illustrated to produce sound is greatly affected by the adjustments to "B". Another factor that can affect the proper operation of this device is the _____.	upward movement of "E"	steam pressure being maintained at +/- 10% of design	changing of the orifice at "I"	overall length of "K"	GS-0099
13	784	C	If the steam flow input device to a two-element feedwater regulator valve fails, the regulator operates as a _____.	constant pump pressure regulator	remote manual control regulator	single-element feedwater regulator	local manual control	
13	785	A	Which following condition could occur if the distilled water tank level indicator has been giving an erroneously high reading?	It is possible to lose vacuum if the level drops below the make-up feed piping connection.	Past logbook entries must all be changed to indicate actual amounts.	The tank may overflow in the engine space causing unnecessary damage to electrical equipment.	All of the above are correct.	
13	786	C	In a tubular-bowl type centrifugal lube oil purifier, any solids separated from the oil are _____.	discharged with the water	removed during the 'shoot' cycle	retained in the bowl	solidified on the upper cover	
13	787	C	Efficient boiler operation is indicated when the percentage by volume of carbon dioxide present in combustion gases is between _____.	1 and 10	10 and 11	12 and 14	15 and 17	
13	788	B	In a steam assist atomizer, the fuel oil/steam mix takes place entirely within the _____.	tangential slots	mixing chamber	whirling chamber	fuel oil swirliers	
13	789	A	Foaming and moisture carryover in a boiler can be caused by an _____.	excessive amount of dissolved solids in the boiler water	excessive acidity level in the boiler water	inadequate amount of dissolved oxygen in the boiler water	inadequate alkalinity content in the boiler water	
13	790	D	If the pressure control disk in the soot blower illustrated, is moved to a higher position, the result will _____.	cause the soot blower to rotate faster	cause the soot blower to rotate slower	decrease the amount of steam valve travel	increase the steam pressure in the rotating blower element	SG-0023
13	791	B	In a reaction turbine, the axial thrust due to the reactive force on the rotor blading drives the rotor _____.	toward the high pressure end	toward the low pressure end	against the dummy piston	toward the diaphragm squealer rings	
13	792	C	Safety valves should be set to lift at or below the maximum working pressure allowed by the _____.	Marine Power Plant Guide	Marine Engineering Regulations	Certificate of Inspection	Marine Engineer's Manual	

13	793	B	If the feedwater flow input device to a multi-element feedwater regulator fails, the valve will be controlled as a _____.	single element feedwater regulator	double element feedwater regulator	triple element feedwater regulator	local manual control device	
13	794	B	The term 'shrink' relates to a change in boiler water level which _____.	results when the feed rate becomes erratic during maneuvering	is due to the steam bubbles below the surface occupying a smaller volume	results in a rapid change of steam temperature	indicates a high chloride concentration in the boiler water	
13	795	B	The purpose of the air chamber at the discharge side of a steam reciprocating boiler feed pump is to _____.	facilitate draining of the cylinder	reduce pulsations in the feed line	adjust the speed of the pump	provide for the addition of boiler compound	
13	796	A	Which steam plant watch operating condition will require priority attention over the other situations listed?	Low level, lube oil gravity tank	High level, lube oil storage tank	Low level, chlorination section of the sewage tank	Low lube oil level to operating, chemical dosing pump	
13	797	C	Generally, a 12% to 14% content of carbon dioxide in boiler flue gases indicates _____.	too much excess air	a high vanadium content in the fuel oil	proper combustion of the fuel oil	carbon deposits in the uptakes	
13	798	D	High temperature at the superheater outlet would be caused by _____.	outer casing leakage	improper turn down ration	rapid fuel oil atomization	excessive excess air	
13	799	B	Foaming in boiler water is a result of _____.	carryover	excessive suspended solids	low water level	excessive surface blows	
13	800	D	What physical changes will occur to the steam within a boiler that has been properly bottled up when additional heat is applied?	The steam pressure and it specific volume will remain constant.	The pressure will increase and the volume will remain constant.	The pressure will remain constant and the specific volume will increase.	The pressure will increase and the specific volume will decrease.	
13	801	D	Which of the following types of main propulsion turbines is most likely to require a dummy piston or cylinder arrangement to counterbalance axial thrust?	Double flow impulse turbine.	Multistage impulse turbine.	Double flow reaction turbine.	Single flow reaction turbine.	
13	802	C	The bottom blow valve should be used to remove sludge and solids which have settled out of circulation after the boiler _____.	is at full load	is at low load	is secured	is being brought up to steaming pressure	
13	803	A	Which of the listed mediums should be used when water washing a boiler?	Heated freshwater	Cold freshwater	Cold condensate	Warm condensate	
13	804	B	If a boiler is brought on the line with its steam pressure much higher than that of the boiler already on the line, there is danger of _____.	thermal shock	priming and carryover	low water	an overloaded superheater	
13	805	B	What steps should be taken if excessive steaming and vigorous bubbling occurs in the first section of the drain inspection tank?	Systematically locate and isolate the faulty traps in the main steam piping to the turbogenerator.	Locate and secure any unnecessarily opened steam trap bypass valve.	Secure the fuel oil heater currently in use.	All of the above are correct and each step should be taken promptly.	

13	806	C	When you are transferring fuel oil to another double bottom tank precautions to be observed should include _____.	plugging gooseneck tank vents to prevent accidental overflow	maintaining a high transfer rate until a slight trickle of oil is observed flowing from the overflow line	sounding the tanks frequently and reducing the transfer rate while topping off	maintaining a supply of chemical dispersant to cleanup minor oil spills adjacent to the ship	
13	807	D	What percentage of CO2 in a boiler flue gas analysis would indicate perfect combustion?	0%	3%	6%	12%	
13	808	B	Compared to the return flow oil burner system, an internally mixed steam atomizer requires _____.	higher fuel oil viscosity	less excess air	higher air velocity	greater turbulence in the air/oil stream	
13	809	C	Foaming in boiler water is caused by _____.	neutral water	acidic contamination	high boiler water alkalinity	low boiler water alkalinity	
13	810	D	What will occur if the level of the atmospheric drain tank (fresh water collector) is permitted to continuously decrease while the vessel is underway?	The amount of condensate pumped to the contaminated evaporator will decrease.	The pressure of the contaminated steam system will drop once the tank is empty.	Make-up water will be automatically added to the tank via a vacuum drag arrangement.	There is a possibility of loosing vacuum in the main condenser.	
13	811	B	In which type of turbine does a pressure drop exist through the fixed blades and the moving blades?	Impulse	Reaction	Rateau	Curtis	
13	812	C	The purpose of the boiler bottom blow valve is to _____.	remove scum from the steam drum during steaming	control steam drum water level in an emergency	remove heavy solids from the water drum	all of the above	
13	813	D	Which of the conditions listed would cause the stern tube lube oil head tank level to decrease?	An increase in sea water temperature.	The entry of sea water into the system.	The proper closure of a drain valve.	A worn or damaged stern tube seal.	
13	814	C	The distilled water tank has been determined to be 75% full. The tank connection to the pneumericator has been disconnected for a maintenance check. If the pneumericator operates correctly, the gage should indicate _____.	a value equal to three fourths of the actual level	a false high reading possibly permitting the entry of air into the system	the minimum value display along the provided scales	the absence of mercury in the system	
13	815	B	During an inport watch onboard a tank vessel while cargo operations are in progress, with the jacking gear engaged and running, you notice a 200 gallon drop in the reduction gear lube oil sump level. Which components or conditions should be checked immediately?	Inspect proper line-up of lube oil service pumps.	Confirm with deck officer that there was a change in vessel trim.	Verify the correct line-up of the lube oil transfer tank gravity overflow line.	All of the above are correct.	

13	816	C	A steam propelled tank ship is operating at sea and despite troubleshooting the system by all the vessel's engineers, the transfer of fuel to the settler has not been possible and the settler will be empty in a few minutes. As the watch engineer, your NEXT step should be to _____.	repeat all the steps that have been taken to determine the cause of the problem	call out other engineers for assistance	line up the diesel cold start system	stop the main engine and secure the generator	
13	817	A	In which order should the chemical test analysis of boiler flue gas samples be made?	CO2, O2, CO	CO, CO2, O2	O2, CO, CO2	CO, O2, CO2	
13	818	D	Which steam plant watch operating condition will require priority attention over the other situations listed?	Low level of lube oil in cleansing tank	High level of lube oil in storage tank	Low level effluent in chlorination section of sewage tank	High water level in main propulsion boiler	
13	819	D	Foaming in a boiler can be caused by _____.	high total solids	high alkalinity	excessive phosphate	all of the above	
13	820	C	What steps should be taken if excessive steaming and vigorous bubbling occurs in the first section of the drain inspection tank?	Secure the fuel oil heater currently in use.	Locate and open any unnecessarily closed steam trap bypass valves.	Systematically locate and isolate any faulty traps in the contaminated steam system piping.	All of the above are correct and should be performed in the order as shown.	
13	821	A	Which steam plant watch operating condition requires priority attention over the other conditions listed?	High level main condenser	High lube oil storage tank level	Low sewage tank chlorination section level	Vapor issuing from deaerating heater vent	
13	822	D	The guarding valve installed in a boiler bottom blow line prevents _____.	loss of steam and water from a steaming boiler due to a leaking bottom blow valve	leakage from the blow line back to an idle boiler	entry of seawater into idle boilers due to leaking skin and bottom blow valves	all of the above	
13	823	B	Which steam plant watch operating conditions requires priority attention over the other situations listed?	High level of lube oil in the refrigeration compressor	High water level in the deareating feedwater heater	Low level effluent in chlorination section of sewage tank	High level water in the fuel oil sludge tank	
13	824	A	The steam soot blower piping should be thoroughly drained before operating to prevent _____.	impinging of generating tube surfaces	feedwater losses	plugging of nozzles	warping of soot blower elements	
13	825	B	A salinity indicator cell is located in the _____.	seawater side of the main condenser	main condenser hotwell	evaporator brine suction line	low pressure turbine casing drain	
13	826	A	A closed feedwater system when compared to an open feedweater system has the advantage(s) of _____. I. being capable of removing a greater percentage of dissolved oxygen II. having fewer components to maintain	I only	II only	Both I and II	Neither I nor II	

13	827	D	A mechanical carbon dioxide recorder operates by detecting the difference between air and the _____.	color of boiler flue gases	temperature of the flue gases	soot content of the flue gases	specific weight of the flue gases	
13	828	B	Which of the following procedures represents the proper care of unused burners during low load conditions?	They should be removed, cleaned, refitted with smaller tips and reinstalled to be ready for immediate use.	They should be removed, cleaned and stored in the rack on the burner bench.	They may be left in place, with fuel and steam secured as long as they are not fouled.	They may be left in place, but only if they are clean and if fuel oil is recirculated to provide cooling.	
13	829	B	For a gravity type lube oil system, a remote pressure sensing device is installed at the point of highest static head pressure on the main unit to enable the watch engineer to _____. I. be certain that the bearings are being adequately lubricated II. determine if there is sufficient lube oil pressure to the main engine	I only	II only	Both I and II	Neither I nor II	
13	830	C	Superheated steam is provided to operate the main steam turbine instead of saturated steam due to its _____. I. higher thermal energy per pound II. lesser erosive action on turbine blading	I only	II only	Both I and II	Neither I nor II	
13	831	D	Operating a steam turbine propulsion unit at medium speed, in an area with extremely cold seawater and the main circulating pump providing full cooling water flow to the condenser will result in _____.	excellent plant efficiency due to higher attainable vacuum	increased plant efficiency due to increased condensate depression	increased effectiveness of the air ejectors due to the increased main condenser vacuum	increased condensate aeration due to the inability of the air ejectors to remove excessive air accumulation from the condenser	
13	832	C	Before giving a boiler a bottom blow, it should be taken off the line and then the _____.	water level initially lowered below normal	boiler steam pressure should be increased	water level initially raise above normal	boiler air cock should be cracked	
13	833	B	During the operation of the illustrated device, water is observed in small quantities in chamber "M", this is _____.	normal for this particular operation	a drawback in having 'wet oil' pass through a clarifier	a result of using too large of a dam ring	a result of using too small of a dam ring	GS-0124
13	835	C	Which of the following locations could desuperheated steam be consider to occur? I. spray attemporator II. main engine extractions	I only	II only	Both I and II	Neither I nor II	
13	837	A	When testing boiler flue gas with a chemical absorption apparatus, to obtain accurate results _____.	prevent any air from contaminating the gas sample	analyze for CO, O2 and CO2 in that order	run each analysis for at least 3 minutes	purge the apparatus with air before use	

13	838	D	The primary function of burner atomization steam is to _____.	maintain a constantly high fuel pressure	prevent overheating of the atomizer when secured	maintain a constantly high fuel temperature	impart swirling motion to the oil for efficient combustion	
13	839	B	A thick dark colored ring three to four inches wide forming at the steaming level in the boiler steam drum is usually evidence of _____.	turbine oil contamination of feedwater	fuel oil contamination of feedwater	black iron oxide pitting	alkaline sludge deposition	
13	840	C	How is a diaphragm type steam whistle protected from damage due to entrained condensate?	High temperature steam is used in the whistle.	Condensate drains from the horn each time the whistle is blown.	A water separator is installed in the steam supply line.	The diaphragm separates condensate from steam.	
13	841	D	An excessive power loss in a straight reaction turbine is commonly caused by _____.	improper nozzle angle	excessive fluid friction	leaking diaphragm packing	abnormal tip leakage	
13	842	C	When is the best time to give a boiler a bottom blow?	Just before placing it on the line.	Just after placing it on the line.	Just after taking it off the line.	When the boiler pressure has dropped to zero.	
13	843	B	The sample of oil discharged from the device illustrated appears milky white, and is probably due to _____.	normal operation	worn or bad bearings in "C"	weaken spring below "V"	position of "P" is too high in the bowl	GS-0124
13	844	D	Clean oil leaves the centrifuge illustrated through item _____.	K	N	V	X	GS-0124
13	845	C	If the salinity indicator located in the main condensate pump discharge piping causes an alarm to sound there is a danger of _____.	low condensate depression	low condensate temperature	salting up the boilers	contaminating the distilled tank	
13	846	A	The differential temperature of the main condenser circulating water during normal operation will be affected by _____. I. Change in circulating pump speed II. The addition of make up feed	I only	II only	Both I and II	Neither I nor II	
13	847	A	The absence of carbon monoxide in the flue gas of a boiler indicates _____.	nearly complete combustion	too much excess air	contaminated fuel oil	low carbon content of fuel	
13	848	A	A boiler has a steam delivery capacity of 100,000 pounds per hour, and is equipped with four steam atomizing burners. If the load range of the burners is 4 to 1, this means that _____.	the boiler may be operated down to 25,000 pounds per hour without securing any burners	the boiler may be operated down to 25,000 pounds per hour only after three burners are secured	if two burners are operating, steam output will be a minimum of 50,000 pounds per hour	all four burners combined can supply up to 400,000 pounds of steam per hour	
13	849	A	Excessive alkalinity of boiler water will cause _____.	caustic embrittlement	scale formation	calcium carbonate precipitation	sodium sulfite reacting with dissolved oxygen	
13	850	D	A vent line is provided on each water box of the main condenser in order to prevent _____. I. excess pressure from being exerted on the tube sheet II. vapor binding of the main circulating pump	I only	II only	Both I and II	Neither I nor II	

13	852	C	Which of the precautions listed should be taken prior to blowing down a boiler water wall header?	Relieve the pressure and cool down the boiler.	Raise the water level above the surface blow.	Take the boiler out of service.	Reduce the firing rate of the boiler to its minimum.	
13	853	D	Which condition would cause an excessively high level in the deaerating feedwater tank (Direct Contact) heater during maneuvering?	Excessive dumping of feedwater to the distilled water tank.	Excessive recirculation of condensate to the auxilary condenser.	Improper operation of the live steam makeup valve supplying the auxiliary exhaust system.	Open bypass valve to the automatic makeup valve assembly.	
13	854	A	As the saturation pressure of a fluid is increased, the relative values shown on the graph will change and _____.	decrease the length of line 4	not affect the the length of line 4	decrease the amount of BTU's per pound per degree change for line 5	decrease the length of line 3	SG-0001
13	855	B	If a salinity alarm system indicates 2.5 grains per gallon at the main condensate pump discharge, your first action should be to _____.	blowdown the boilers and add make up water	chemically test the condensate for chloride content	reduce main engine speed and line up the exhaust to the auxiliary condenser	calibrate the salinity cell for accuracy	
13	856	B	Air leaks to the boiler inner casing could cause _____. I. oxidation of furnace surfaces II. less than adequate combustion temperatures	I only	II only	Both I and II	Neither I nor II	
13	857	C	The differential temperature of the main condenser circulating water will be affected by _____. I. change in sea temperature II. degree or amount of scaling or fouling	I only	II only	Either I or II	Neither I nor II	
13	858	B	In a steam assist fuel oil atomizer, the steam pressure is higher than the oil pressure at _____.	design boiler load	minimum boiler load	high fuel viscosity	low fuel viscosity	
13	859	C	Babbitt metal is used to make _____.	pump packing rings	shaft journals	bearing surfaces	nonsparking tools	
13	860	B	A steam supplied heat exchanger will fail to maintain the designed quantity of heated liquid output if the _____. I. steam supply absolute pressure is increased II. tubes are leaking	I only	II only	Both I and II	Neither I nor II	
13	862	D	If a boiler is being steamed at a high firing rate, blowing down a water wall header without taking any other precaution could result in _____.	excessive strain on boiler blowdown lines	erratic operation of the automatic feedwater regulating valve	load imbalance between other boilers on the line	interruption of water circulation	
13	863	B	Scavenging air lines are connected to stack periscopes to _____. I. keep the mirrors clean II. protect the optical devices from boiler combustion gases	I only	II only	Both I and II	Neither I nor II	

13	864	C	A flue gas air heater, when installed in a boiler, would be accompanied by the operating characteristic(s) of _____. I. higher furnace temperatures than a boiler without an air heater II. greater heat absorption per pound of fuel	I only	II only	Both I and II	Neither I nor II	
13	865	C	If a ship is to be laid up for an indefinite period, the steam side of the main condenser should be _____.	filled with moist air	left under a vacuum	completely drained of water	pressurized to approximately 5 psig with nitrogen, 99.5% pure by volume	
13	866	C	When required, the metal thickness of boilers can be tested by _____. I. non-destructive gauging II. drilling, followed by visual inspection	I only	II only	Both I and II	Neither I nor II	
13	867	C	The efficiency of boiler combustion can be measured by the relative proportions of certain elements in the flue gases. The elements measured are _____.	nitrogen, carbon dioxide, and oxygen	nitrogen, carbon monoxide, and oxygen	carbon dioxide, oxygen, and carbon monoxide	nitrogen, carbon dioxide, and carbon monoxide	
13	868	B	Why should the fuel oil be recirculated before lighting off a cold boiler?	To allow the fuel strainers to thoroughly clean the fuel.	To heat the fuel enough for proper atomization.	To ensure that all water is removed from the fuel.	To allow fuel pressure to buildup gradually.	
13	869	C	The formation of a pit in a boiler tube is most likely to occur when _____.	waterside deposits are present	sludge is present	dissolved oxygen is present	the tube metal acts as a cathode	
13	870	C	While bunkering your ship, the #3 double bottom tanks across are the last to be filled, with the centerline tanks being relatively the largest. These four tanks were empty at the beginning of bunkering, and each of the four transfer valves are the same size and have been opened the same number of turns. In general, you would find that _____.	all four tanks will be topped at the same time	to top off the centerline tanks last, the valves to the outboard tanks should be choked closed until the static leg pressure begins to rise	to top off the centerline tanks last, the valves to these tanks should be choked closed until the static leg pressure begins to rise	it is best to top off the outboard tanks last as small tanks are easier to control when completing the filling of the tanks.	
13	872	D	Blowing down a water wall header while steaming a boiler at a high firing rate could result in _____.	excessive strain on boiler blowdown lines	the thermo-hydraulic feedwater regulator valve slamming closed	a load imbalance between other boilers on the line	an interruption in the water circulation	
13	873	A	In order to test the lifting pressure of the deaerating feed heater relief valve, you would _____. I. close the auxiliary exhaust dump valves to the main and auxiliary condensers II. increase the set point of the reduced steam pressure to the auxiliary steam system	I only	II only	Both I and II	Neither I nor II	

13	874	D	For a gravity type lube oil system, a remote pressure sensing device is installed on the main unit to enable the watch engineer to _____. I. determine if there is sufficient lube oil flow to the main engine II. be certain that the bearings are being adequately lubricated	I only	II only	Both I and II	Neither I nor II	
13	875	B	Electrolytic corrosion in the condenser circulating water system can be reduced by _____.	decreasing the velocity of the circulating water through the waterboxes	using zinc plates in the waterboxes	chemically treating the condensate formed in the hotwell	decreasing the volume of water in the system	
13	876	C	In order to prevent fires from occuring in drum type rotating air heaters _____. I. soot blowers need to be used when boiler is operating at low loads II. stack gas temperatures should be maintained as low as possible	I only	II only	Both I and II	Neither I nor II	
13	877	A	Which condition would cause a dangerously low level in the deaerating feedwater tank (Direct Contact) heater during maneuvering?	Excessive dumping of feedwater to the distilled water tank via the automatic dump valve.	Excessive recirculation of condensate to the drain inspection tank.	Improper operation of the auxiliary exhaust live steam dump valve.	Open bypass valve of the automatic/pneumatic makeup valve assembly.	
13	878	D	Which test(s) are normally required to be performed on a propulsion boiler during an annual inspection? I. An accumulation test II. An evaporation rate test	I only	II only	Both I and II	Neither I nor II	
13	879	B	Dissolved oxygen entrained in the feedwater entering a boiler can cause _____.	erosion	localized pitting	caustic embrittlement	acid corrosion	
13	880	C	The differential temperature of the main condenser circulating water will be affected by _____. I. decrease in circulating pump pressure II. degree or amount of scaling or fouling	I only	II only	Either I or II	Neither I nor II	
13	881	C	Which of the listed procedures should be followed in preparing a main propulsion plant for getting underway?	Start the condensate and circulating pumps, check and start the lube oil system, engage the turning gear, then start the first-and second-stage air ejectors and the gland sealing.	Start the condensate and circulating pumps, check and start the lube oil system, start the air ejectors and the gland sealing system, then engage the turning gear.	Check and start the lube oil system, engage the turning gear, start the condensate and circulating pumps, start the gland sealing system and second-stage air ejector.	Check and start the lube oil system, start the second-stage air ejector and the gland sealing system, start the condensate and circulating pumps.	

13	882	A	Under what operating conditions may water wall header drains be used for blowdown?	Only if the fires are secured and no steam is being generated.	During periods of carryover in the steam drum.	When the water level is out of sight in the gage glass.	When it is necessary for rapid drainage of the boiler.	
13	883	B	A water-tube type boiler is more efficient than a fire-tube type boiler as _____. I. a water-tube boiler requires less maintenance II. the water-tube boiler produces more pounds of steam per pound of boiler	I only	II only	Both I and II	Neither I nor II	
13	884	B	A water-tube type boiler when compared to a fire-tube type boiler has an advantage of _____. I. a water-tube boiler requiring less chemical compounding II. the fire-tube boiler providing a greater amount of heat transfer to the water as the hot gases pass through the tubes	I only	II only	Both I and II	Neither I nor II	
13	885	A	Vapor blowing from the air ejector condenser vent may be caused by _____.	insufficient condensate flow	excess makeup feed being taken into the system	low condensate temperature	excessive condensate pump speed	
13	886	B	A vent line is provided on each water box of the main condenser in order to prevent _____. I. insufficent head pressure being developed on the circulating pump discharge II. inadequate heat transfer from developing during normal operation	I only	II only	Both I and II	Neither I nor II	
13	887	A	When burning fuel oil in a boiler, a high CO2 content is desired in the stack gas because _____.	more heat is liberated by the production of CO2 than CO	less excess air is required to produce CO2 than CO	efficient combustion is indicated even though the heat liberated is less than the heat produced by burning to CO	efficient combustion is indicated and the heat liberated is equal to the heat produced by the formation of CO	
13	888	C	When recirculating fuel oil prior to cold boiler start-up, which of the listed actions should be carried out?	Increase forced draft fan speed.	Decrease forced draft fan speed.	Open the fuel oil meter bypass.	Open the fuel oil heater bypass.	
13	889	A	Babbitt is a metal alloy commonly used for lining _____.	bearings	cylinder liners	bearing journals	saltwater piping	
13	890	D	Machinery operating features are designed to help conserve energy. Which of the following will not contribute to energy conservation?	Reduction of friction.	Insulation of hot surfaces.	Lubrication of moving parts.	Elevation of condenser temperatures.	
13	891	D	Prior to rolling the main turbines in preparation for getting underway, you should _____.	check the bilge level warning light to ensure it is extinguished	open the reduction gear casing access plates and inspect the lube oil spray pattern	circulate the lube oil through both banks of the cooler	disengage the turning gear	

13	892	D	Advances in metallurgy and improved methods of boiler tube fabrication has led to lighter tubes with wall thicknesses in the vicinity of 0.1 inches. A characteristic of these thin walled tubes is _____.	low tube metal temperatures	decreased probability of tube failure during normal operating conditions	better heat transfer characteristics	all of the above	
13	893	A	A steam supplied heat exchanger will fail to maintain the designed quantity of heated liquid output if the _____. I. steam side shell absolute pressure is decreased II. heat exchanger drain is leaking	I only	II only	Both I and II	Neither I nor II	
13	894	C	Which condition would cause an excessively high level in the deaerating feedwater tank (DC heater)?	Excessive dumping of feedwater to the distilled water tank.	Excessive recirculation of condensate to the auxiliary condenser.	Improper operation of the condensate makeup valve.	Improper operation of the air ejector loop seal.	
13	895	D	Scale in the air ejector first-stage nozzle could cause a decrease in the _____.	air ejector steam supply pressure	low pressure turbine exhaust temperature	condensing temperature in the condenser	condenser vacuum	
13	896	B	A rapid loss of water from the deaerating feed tank and the sudden overflow of water from the distill tank would be caused by _____. I. a sudden increase in steam demand while maneuvering II. an unrestricted opening in the condensate spill line from the deaerating feed tank	I only	II only	Both I and II	Neither I nor II	
13	897	D	A flue gas air heater, when installed in a boiler would be accompanied by the operating characteristic(s) of _____. I. higher uptake temperatures than a boiler without an air heater II. lower corrosion rates in the uptakes and economiser	I only	II only	Both I and II	Neither I nor II	
13	898	A	When preparing to light off a cold boiler, the fuel oil should be recirculated until it is _____.	heated enough for fine atomization	thoroughly cleaned by the fuel oil strainers	viscous enough for rapid pumping	entrained with air bubbles	
13	899	B	In a water-tube boiler, waterside scale formation is caused by _____.	sodium phosphate	calcium sulfate	magnesium phosphate	sodium hydroxide	
13	900	C	Excessive priming in a propulsion boiler can cause severe damage to the_____. I. integral superheater II. main steam turbine	I Only	II Only	Both I and II	Neither I nor II	
13	901	D	Which of the following problems can occur from improper main turbine warm-up?	Distortion of the rotor	Rubbing of blades	Uneven casing heating	All of the above	
13	902	B	If it becomes necessary to remove water from a pressurized main boiler, it should be directed _____.	into the bilges	overboard through the bottom blow line	into the cofferdam	into the reserve feed tank	

13	903	C	Which condition would cause a dangerously low level in the deaerating feedwater tank (Direct Contact) heater as the vessel is increasing from maneuvering to sea speed?	Excessive dumping of feedwater to the drain inspection tank via the automatic dump valve	Excessive recirculation of condensate to the drain transfer tank	Internal collapse of a rubber expansion joint located in the condensate pump suction line	Clogged "Y" strainer at the condensate inlet of the pneumatically operated condensate recirculating valve assembly	
13	904	D	Excessive priming in a propulsion boiler can lead to severe damage of the _____. I. downcomers installed in a "D" type boiler II. main steam turbine reduction gears	I Only	II Only	Both I and II	Neither I nor II	
13	905	A	Insufficient cooling water circulation through air ejector intercondensers and aftercondensers will cause _____.	decreased vacuum in the main condenser	overheating of the air ejector nozzles	flooding of the aftercondenser	flooding of the loop seal	
13	906	C	The first and second stage air ejectors used with large sea water cooled steam, surface type condensers are designed to _____. I. establish vacuum II. maintain vacuum	I only	II only	Both I and II	Neither I nor II	
13	907	D	An explosion or flareback could occur in a boiler if _____.	too much excess air were supplied for combustion	the boiler firing rate exceeded the end point of circulation	the fuel being burned had been heated to the flash point	the firebox is not purged before attempting to light a fire	
13	908	D	Boiler downcomers serve the purpose of _____. I. distributing water within the water or mud drum II. increasing the end point of carry-over	I only	II only	Both I and II	Neither I nor II	
13	909	B	Boiler water hardness is increased by _____.	zero alkalinity in the water	scale forming salts in the feedwater	dissolved gases in the water	improper operation of the DC heater	
13	910	D	A badly warped boiler water tube can be reworked and bent back into shape by _____. I. heating it with a torch and reforming it with a soft mallet II. cold pressing it back into shape with a hydraulic jack	I only	II only	Both I and II	Neither I nor II	
13	911	D	Turbine throttling losses can best be described as a loss of energy occurring _____.	as a result of friction created when steam passes through the nozzle block	whenever there is leakage of steam from one stage to another through the throttle valve packing gland	as a result of fluid friction caused by frequently throttling the turbine wheel and blade speed	as steam passes through the steam admission valve and there is a drop in pressure without the performance of work	
13	912	A	Which of the following statements represents the advantage of using a small diameter boiler tube over a larger diameter tube?	Small diameter tubes reduce gas turbulence in the tube banks.	Small diameter tubes reduce the heating surface area.	Small diameter tubes are less affected by the insulating properties of soot.	Small diameter tubes provide for greater heat transfer rates.	

13	913	C	The steam drum installed in "D" type boilers serve to provide _____. I. a water reserve necessary for proper boiler operation II. an area for steam and moisture to separate	I only	II only	Both I and II	Neither I nor II	
13	914	A	According to Coast Guard Regulations (46 CFR), periodic hydrostatic tests are required to be conducted without exception on all _____.	main propulsion boilers	auxilliary steam piping	air receivers	all of the above	
13	915	D	If the cooling water flow through the air ejector intercondensers and aftercondensers is inadequate, which of the problems listed will occur?	Air ejector nozzles will erode.	Aftercondenser will be flooded.	Loop seal will overheat and flash.	Absolute pressure will increase.	
13	916	D	In order to test the lifting pressure of the deaerating feed heater relief valve, you would _____. I. place a gag on the relief valve II. increase the set point of the reduced steam pressure to the auxiliary steam system	I only	II only	Both I and II	Neither I nor II	
13	917	D	Before an explosion can occur in a boiler furnace, there must be an accumulation of unburned fuel, sufficient air to form an explosive mixture, and a _____.	space large enough for the explosion to occur	ground in the burner ignition electrode	high steam demand on the boiler	source of ignition for the explosive mixture	
13	918	B	The vent line from the main condender water boxes was not opened when the waterside was recharged. This would _____.I. lead to a build up of pressure on the tube sheet of greater than 40 psig.II. prevent the design vacuum from being attained under normal operating conditions at sea	I only	II only	Both I and II	Neither I nor II	
13	919	A	Scale formation on the waterside of boiler tubes, is generally produced by _____.	the salts of calcium and magnesium	metal oxides in the waterside	dissolved oxygen in the waterside	accumulations of phosphates in the feedwater	
13	920	D	Burning of the firesides of tube in a water tube boiler is a direct result of _____.I. flame impingement II. excessive fuel atomization	I only	II only	Both I and II	Neither I nor II	
13	921	C	Which of the following statements represents an example of a throttling loss in a turbine?	Friction as steam passes over the walls of the nozzles.	Steam leaving the last stages of the turbine.	Steam passing through a steam admission valve.	Steam leaking over the tips of fixed and moving blades.	
13	922	C	The greatest resistance to heat transfer from the fireside to the waterside of a water-tube boiler takes place in the _____.	steel tube wall itself	soot buildup directly on the tube exterior	gas film layer surrounding the tube	moving water and steam inside the tube	

13	923	D	Which condition would cause a dangerously low level in the deaerating feedwater tank (Direct Contact) heater as the vessel is increasing from maneuvering to sea speed?	Excessive dumping of feedwater to the drain inspection tank via the automatic dump valve.	Excessive recirculation of condensate to the drain transfer tank.	Improper operation of the auxiliary exhaust live steam dump valve.	Clogged "Y" strainer at the air supply of the pneumatically operated condensate makeup valve assembly.	
13	924	C	According to Coast Guard Regulations (46 CFR), what is the maximum time interval for hydrostatically testing boilers on a cargo vessel having water-tube boilers?	1 year	2 years	5 years	8 years	
13	925	C	Excessively hot water returning to an atmospheric drain tank indicates _____.	the condensate recirculating valve is open	there is a loss of circulating water	a steam trap is hung open	a heating coil has ruptured	
13	926	D	An accumulation of slag build up on the boiler furnace floor will cause _____. I. peeling of furnace brickwork II. overheating of the furnace floor	I only	II only	Both I and II	Neither I nor II	
13	927	C	The most troublesome corrosive substances in boiler water are oxygen and _____.	hydrogen sulfide	sulfur dioxide	carbon dioxide	ammonia	
13	928	B	Throttling the burner air register of a lit burner could result in _____.	carbon deposits on the register doors	carbon deposits on the furnace walls	too much excess air for combustion	excess combustion temperature in the furnace	
13	929	D	If the steam whistle shown in the illustration produces a poor, rattling tone when blown, the probable cause is a/an _____.	insufficient steam pressure	defective pilot valve	excessive back cover tightness	a loose back cover	GS-0099
13	930	A	Failure to remove calcium and magnesium from feedwater before it reaches the boiler can result in tube _____.	scaling	pitting	sludging	erosion	
13	931	B	Which of the effects listed describes the changes in the velocity and pressure of the steam as it passes through a nozzle?	Velocity increases and pressure increases	Velocity increases and pressure decreases	Velocity decreases and pressure increases	Velocity decreases and pressure decreases	
13	932	B	In a watertube boiler, circulation is developed by the difference in the _____. I. tube length and various diameters II. densities of the hot and cold water	I only	II only	Both I and II	Neither I nor II	
13	933	A	A ruptured boiler tube should be removed by _____. I. spliting the remaining tube sections with a safety ripping chisel II. cutting out most of the tube and then allowing the remaining portion to disintegrate as the boiler is normally fired	I only	II only	Both I and II	Neither I nor II	

13	934	B	The maximum allowable working pressure of a particular boiler is 1050 psig (7340 kPa). The hydrostatic test pressure to be used during the Coast Guard required quadrennial inspection will be _____.	1050 psig (7340 kPa)	1312 psig (9146 kPa)	1575 psig (10959 kPa)	1850 psig (12855 kPa)	
13	935	A	Which of the conditions listed may be indicated by the lifting of the DC heater relief valve?	A malfunctioning auxiliary exhaust make-up steam regulating valve.	Excessive deaeration of the feedwater.	Low back pressure in the auxiliary exhaust line.	Low water level continually maintained in the DC heater.	
13	936	B	A set of first and second stage air ejectors are used with a large sea water cooled steam condenser. If the first stage air ejector is not in operation _____. I. vacuum can not be established II. maximum operating vacuum can not be maintained	I only	II only	Both I and II	Neither I nor II	
13	937	D	Sediment in fuel oil will cause _____.	sputtering of atomizers	panting in the furnace	excessive white smoke	clogged atomizer tips	
13	938	B	The distance piece in a boiler burner register assembly, provides for adjustment of the _____.	diffuser to attain the desired amount of secondary air flow	atomizer position to obtain the best mixing of air and oil	quantity of the primary and secondary air cones for best air flow	total volume of air and fuel admitted through the register	
13	939	B	The vent line from the main condender water boxes was not opened when the waterside was recharged. This would _____. I. lead to vapor binding of the main circulating pump II. contribute to a higher than normal condensate temperature entering the air ejector condenser	I only	II only	Both I and II	Neither I nor II	
13	940	A	Which steam plant watch operating condition will require priority attention over the other situations listed?	Low oil level in the steering gear sumps	High lube oil level in all storage tanks	Low level effluent in chlorination section of sewage tank	Low bilge water levels throughout entire engineroom	
13	941	B	An intermediate chamber is used in conjunction with labyrinth packing on a compound turbine for sealing steam _____.	leak off during periods of internal vacuum	supply during periods of low internal pressure	supply during periods of high internal pressures	propulsion of peripheral water seals	
13	942	A	Before giving a boiler a surface blow, you should _____.	raise the water level 2 or 3 inches above normal	lower the water level to the normal level	reduce the boiler firing rate to the minimum	take the boiler off the line and let it cool 1 hour	
13	943	C	If flaking of a hard alloy tube is noticed while the tube is being expanded into the tube sheet, this would indicate that _____. I. excessive pressure is being applied to the mandral II. the incorrect mandral is being used	I only	II only	Both I and II	Neither I nor II	

13	944	A	Coast Guard Regulations (46 CFR) require the duplex fuel oil discharge strainers installed in boiler fuel oil service systems to be _____.	located so as to preclude the possibility of spraying oil on the burner or boiler casing	as close to the fuel oil service manifold as practicable	enclosed in a drip-proof vented enclosure to reduce the possibility of fire	a positive venting system that will return any vapors to the pump suction	
13	945	B	If the DC heater relief valve lifts frequently, the cause can be excessive _____.	condensate supplied to the DC heater	auxiliary exhaust steam pressure	feedwater recirculated from the feed pump	makeup feed introduced to the system	
13	947	D	Sediment in fuel oil will cause _____.	wear in the fuel oil pumps	clogging of the fuel oil heaters	wear in the sprayer plates	all of the above	
13	948	B	In an air register assembly, the largest quantity of air passes through the _____.	diffuser or impeller	stationary air foil or bladed cone	air door operating ring	atomizer assembly	
13	949	A	Carbon dioxide dissolved in boiler water is dangerous in a modern power boiler because the gas _____.	forms carbonic acid which attacks the watersides	breaks the magnetic iron oxide film inside boiler tubes	combines with sulfates to cause severe waterside pitting	combines with oxygen to cause severe waterside scaling	
13	951	B	A convergent-divergent nozzle functions to _____.	reverse steam flow direction	control turbulent steam expansion	decrease steam velocity and increase steam pressure	decrease the specific volume of steam	
13	952	D	Before commencing a surface blow, the boiler _____.	should be cold	water level should be lowered to the surface blow line	water drum should be checked for sludge	water level should be raised 2 to 3 inches (5 to 7.6 cm) above normal	
13	953	B	The purpose of the boiler furnace corbel is to _____.I. protect the water drum from direct flame impingement II. support the furnace wall	I only	II only	Both I and II	Neither I nor II	
13	954	B	Coast Guard Regulations (46 CFR) for boiler fuel oil service systems, require that _____.	discharge piping from the service pumps to the burners must be of schedule 60 seamless steel	the return line from the burners must be arranged so that suction piping cannot be subject to discharge pressure	the fuel oil service pump relief valve must discharge to a wing tank	the suction strainer must be a simplex type	
13	955	A	In a boiler equipped with an automatic feedwater regulator, erratic variations in the water level could be caused by _____.	high solids content and foaming in the drum	ruptured feedwater control valve diaphragm	low feedwater temperature	high feedwater temperature	
13	956	A	A boiler water tube would burn out as a result of _____. I. direct flame impingement II. excessive soot accumulation	I only	II only	Both I and II	Neither I nor II	
13	957	A	Water washing of the water-tube boiler firesides is necessary to maintain efficient operation, but can lead to _____.I. sulfuric acid corrosion II. deterioriation of the refactory	I only	II only	Both I and II	Neither I nor II	

13	958	A	Boiler furnace brickwork can be fractured and broken by thermal shock caused by _____.	leaving the registers open on a hot boiler	load changes on the boiler while answering bells	allowing the furnace to cool too slowly	cold feedwater passing through the boiler economizer	
13	959	B	The two most common causes of boiler corrosion attributable to boiler water are dissolved oxygen and _____.	carbon monoxide	hydroxyl ions	ammonia	nitrogen	
13	960	D	A ruptured boiler tube should be removed by _____.I. spliting the tube end three or more times II. cutting out most of the tube and then allow it to disintegrate as the boiler is normally fired	I only	II only	Both I and II	Neither I nor II	
13	961	B	In addition to causing erosion of turbine blades, slugs of water in the steam supply to a turbine driven pump can result in _____.	thermal shock to the bearings	erratic governor operation	loss of load with resultant turbine overspeed	overheating of the wearing rings	
13	962	A	Before giving a boiler a surface blow, you must _____.	open the skin valve on the blowdown line	secure the fires in the furnace	lower the water level to a half glass	increase the boiler steam pressure above normal	
13	963	B	The purpose of firebrick in a water tube boiler furnace is to _____. I. protect the tubes from direct flame impingement II. confine the combustion gases within the furnace	I only	II only	Both I and II	Neither I nor II	
13	964	B	According to Coast Guard Regulations (46 CFR), a 1200 psig maximum allowable working pressure boiler, with external blowoff piping is required to have the blowoff piping withstand a minimum of _____.	1200 psig	1425 psig	1500 psig	1575 psig	
13	965	D	The boiler water level is normal, the main condenser hotwell level is normal, and the DC heater shows a level 40% of full. You should _____.	prime the condensate pump	bypass the vent condenser	slow the main unit	open the makeup feed vacuum drag line	
13	966	C	Thin sheets of mica are installed in boiler gage glasses to _____. I. reduce the possibility of the glass from becoming etched II. limit the possibility of glass being blown out into the fire room	I only	II only	Both I and II	Neither I nor II	
13	967	D	The depth of fuel oil in a double bottom tank is measured through the _____.	vent line	depth gage	manhole cover	sounding tube	
13	968	A	Why are the burner registers closed a few minutes after a boiler has been secured to be cooled?	To prevent cracking the furnace refractory.	To prevent further steam generation.	To allow more rapid furnace cooling.	To allow continued steam generation.	
13	969	A	In a boiler where the drum water level is automatically controlled, which of the following conditions could cause erratic variations in the water level?	High total dissolved solids content and foaming in the drum.	Low pH boiler water value.	Uncontrolled fluctuating deaerator water level.	Inability to maintain or correct high feedwater temperature.	

13	970	C	Sliding contact bearings are classified into two general categories: journal bearings and _____.	radial bearings	needle bearings	thrust bearings	roller bearings	
13	971	B	Most main propulsion reduction gear bearings are _____.	self-lubricating	rigidly mounted	spherical-seated	self-aligning	
13	972	B	When the rate of heat transfer through tube walls is so reduced that the metal becomes overheated, which of the following conditions will result in the boiler?	Steam gouging	Fireside burning	Fireside thinning	Steam binding	
13	973	A	The purpose of the water tube boiler furnace refractory is to _____. I. protect the water drum from direct flame impingement II. reinforce and strengthen the casing	I only	II only	Both I and II	Neither I nor II	
13	974	B	According to Coast Guard Regulations (46 CFR), blowoff piping external to a boiler with a maximum allowable working pressure of 600 psig must be capable of withstanding a minimum pressure of _____.	600 psig	750 psig	825 psig	900 psig	
13	975	C	Saltwater contamination of condensate could occur at which component?	DC heater	Aftercondenser	Evaporator	Intercondenser	
13	976	C	The internal feed pipe in a D-type marine boiler provides _____. I. distribution of feed water evenly throughout the steam drum II. guidance of the feedwater towards the downcomers as it enters the drum	I only	II only	Both I and II	Neither I nor II	
13	977	C	When you are transferring fuel oil to the settling tanks, precautions to be observed should include _____.	plugging gooseneck tank vents to prevent accidental overflow	maintaining a high transfer rate until a slight trickle of oil is observed flowing from the overflow line	sounding the tanks frequently and reducing the transfer rate as the level approaches maximum fill	maintaining a supply of chemical dispersant to cleanup minor oil spills adjacent to the ship	
13	978	D	The main reason for keeping an operating boiler burner register fully open while steaming is to prevent _____.	boiler explosions	the fires being blown out	boiler register warping	improper fuel/air mixture	
13	979	C	In a steaming boiler, most dissolved chlorides tend to concentrate at, or near, the _____.	tube joints	mud drum	water surface	floor tubes	
13	980	B	A leaking boiler desuperheater may be determined by a/an _____.I. gradual, but continual rise in alkalinity II. hydrostatic test	I only	II only	Both I and II	Neither I nor II	
13	981	C	The turbine of a turbo-electric drive should be secured by _____.	closing the main steam stops	dynamic braking of the generator	tripping the throttle trip by hand	closing the throttle by hand	
13	982	A	In automatic combustion control systems, increasing or decreasing a loading pressure by a set amount is called _____.	biasing	loading	relaying	transmitting	

13	983	A	A boiler desuperheater is installed in high pressure boilers to _____. I. maintain flow through the superheater II. raise the steam temperature in the steam drum	I only	II only	Both I and II	Neither I nor II	
13	984	B	Once a huddling chamber type safety valve has begun to initially open, it will then pop open due to the _____. I. expansion of the steam leaving the nozzle II. forces exerted on the projecting lips	I only	II only	Both I and II	Neither I nor II	
13	985	A	A common gas dissolved in water contributing to the greatest amount of corrosion in a condensate system is _____.	carbon dioxide	hydrogen	carbon monoxide	nitrogen	
13	986	C	In a water tube boiler, waterwall tubes are effectively used to _____. I. decrease the amount of refractory material necessary in non-waterwall installations II. allow for significant increases in the combustion rates	I only	II only	Both I and II	Neither I nor II	
13	987	C	Fuel oil is transferred to the settling tanks for _____.	filtering and purifing before being pumped to the burners	purging of any large air bubbles that have formed	heating to allow water and sediment to settle out	heating to the correct temperature for proper atomization	
13	988	C	Shortly after shutting off the fuel to a boiler which is to be secured, the _____.	air cock should be opened	superheater vent may be closed	burner registers should be closed	feed stop must be closed	
13	989	D	A sudden increase in boiler water hardness or chloride content could indicate _____.	a leaking condenser tube	evaporator priming	bilge water leaking into the makeup feed tanks	all of the above	
13	990	D	Thin sheets of mica are installed in boiler gage glasses to _____. I. reduce the effects of thermal exposure on the glass II. enhance the ability of the operator to observe the water level from a distance	I only	II only	Both I and II	Neither I nor II	
13	991	B	The most critical period of main turbine operation is during cold start-up, rather than hot shutdown because _____.	lubricant film thickness during start-up is considerably less than the dimensions of gear surface irregularities	differential expansion can result from the temperature difference between the rotor and rotor casing	the danger of blade erosion damage from dry steam impingement is greater during start-up	harmonic vibrations associated with critical speed can easily be reached during start-up	
13	992	A	Coast Guard Regulations (46 CFR), require main propulsion lube oil systems to be designed to function satisfactorily when the vessel has a permanent _____.	15° list and a permanent 5°Trim	15° list and a permanent 10°Trim	22° list and a permanent 10° trim	30° list and a permanent 10° trim	

13	993	C	An accumulation test is performed on the boiler to determine the suitability of the safety valves and the set points _____. I. if the boiler normal operating pressure is permanently reduced II. when the steam generating capacity is increased	I only	II only	Both I and II	Neither I nor II	
13	994	D	Coast Guard Regulations (46 CFR) require the temperature of the water leaving an oil fired, cast iron, low pressure, hot water heating boiler must not exceed _____.	190°F (87.8°C)	210°F (98.9°C)	230°F (110.0°C)	250°F (121.1°C)	
13	995	A	Carbon dioxide formed by improper chemical treatment in the boiler, may cause corrosion in the _____.	condensate lines	superheater tubes	boiler tubes	boiler desuperheater lines	
13	996	D	Which of the conditions listed should be attended to first upon taking over the watch and why should this step be taken?	Excessive dumping of feedwater to the drain inspection tank. Failure to prevent will cause overflow and loss of distilled water.	Salted up evaporator draining to bilge. Must immediately be restarted to insure sufficient distilled and potable water quantities.	High level in fuel oil sludge tank. Necessary to pump contents to settler to prevent overflow of the tank into the bilges.	Broken air line to condensate makeup actuator. Repair or place in bypass control to insure proper levels throughout condensate and feedwater systems.	
13	997	D	The main reason for having a low suction line on the fuel oil service or settling tanks is to _____.	prevent loss of suction during rough weather	decrease suction head on the pump	increase the amount of fuel available for use	facilitate water removal	
13	998	B	What is the purpose of the movable air doors in an air register?	Regulate the temperature of air entering the furnace.	Function to open and close the register.	Maintain airflow across the forced draft fan.	Support the burner distance piece.	
13	999	D	The internal feed pipe in a D-type marine boiler provides _____. I. distribution of feed water evenly throughout the water drum II. guidance and distribution of chemicals throughout the steam drum	I only	II only	Both I and II	Neither I nor II	
13	1000	A	A leaking boiler desuperheater may be indicated by a/an _____.I. gradual, but continual rise in phosphate readings in only one boiler II. inability to maintain normal working pressure in the auxiliary steam system	I only	II only	Both I and II	Neither I nor II	
13	1001	A	The diameter of a dummy piston installed in a reaction turbine is determined by _____.	rotor design and the amount of thrust to be counteracted	steam temperature and design RPM	the length and diameter of the equalizing line	the volume of the exhaust trunk and pressure drop over the last stage	

13	1002	A	Coast Guard regulations require that the superheater safety valves _____. I. and the drum safety shall have a total rated capacity not less than the maximum generating capacity of the boiler II. be set and adjusted under pressure, regardless of the pilot pressure source	I only	II only	Both I and II	Neither I nor II	
13	1003	A	The combustion air pressure is increased when using the steam soot blowers to 'blow tubes' in order to _____. I. aid in the process of removing soot deposits II. prevent the steam from extinguishing the fires	I only	II only	Both I and II	Neither I nor II	
13	1005	D	If the salinity indicator registers high salinity in the hotwell, you should suspect the cause to be _____.	leaking air ejector condenser tubes	leaking tubes in the third-stage heater	high water pressure in the lube oil cooler	leaking condenser tubes	
13	1006	C	Corrosion of the flue gas side of the economiser can be a result of the _____. I. stack gas temperature being lower than the dew point II. feedwater temperature being excessively cool	I only	II only	both I and II	neither I or II	
13	1007	A	Which of the following actions should be taken FIRST when water is found in the fuel oil settling tank?	Shift pump suction to an alternate settling tank.	Shift to alternate or standby fuel oil service pump.	Sound the settling tank with water indicating paste.	Determine the extent of water contamination by reading the pneumercators.	
13	1008	B	Identify the system shown in the illustration.	Bleed steam	Auxiliary steam	High pressure drains	Auxiliary condensate	SG-0005
13	1009	A	The illustrated burner atomizer assembly is _____.	straight mechanical	used only for variable load steam atomization	an example of a rotary cup type atomizer	used in a return flow type burner management system	SG-0022
13	1010	B	A boiler desuperheater is installed in high pressure boilers to _____. I. maintain the essential flow of feedwater into the drum II. raise the feedwater temperature entering the steam drum	I only	II only	Both I and II	Neither I nor II	
13	1011	B	The axial position of a turbine rotor is controlled by the thickness of the _____.	thrust bearing shoes	thrust bearing filler piece	journal bearing shims	labyrinth packing fins	
13	1012	B	Proper use of the boiler surface blow will _____.	remove most precipitated solids	remove floating impurities from boiler water	disrupt circulation in a steaming boiler	have no effect on boiler alkalinity	
13	1013	D	When starting a turbogenerator in an automated plant, you must provide lube oil pressure to the unit by means of _____.	a line from the other generator	a line from the gravity tank	the main lube oil pump	the hand operated or auxiliary lube oil pump	

13	1014	A	When preparing to hydrostatically test water-tube boilers, you should _____.	fill the boiler with water not less than 70°F (21.1°C), nor more than 160°F (71.1°C)	make arrangements for simultaneously testing main and auxiliary steam stops with water and steam pressure	remove all inspection plates and manhole covers as required by the marine inspector	have the boiler warmed to a temperature not exceeding 100°F (37.8°C)	
13	1015	B	The relieving capacity of the superheater safety valves is considered to be insufficient when the working pressure of the boilers is _____. I. increased II. Decreased	I only	II only	Both I and II	Neither I nor II	
13	1016	B	The safety valve hand lifting gear should not be used if the boiler pressure is less than 75% of the safety valve popping pressure in order to _____. I. provide sufficient steam flow across the valve to prevent the collection of scale on the seat II. prevent cracking of the seat due to chattering of the feather and disc	I only	II only	Both I and II	Neither I nor II	
13	1017	C	When heated, fuel oil will _____.	increase in specific gravity	have a higher specific heat	expand in volume	increase in viscosity	
13	1018	D	If one burner of a group of operating burners in a steaming boiler is cut out, the register doors for that burner should be _____.	left wide open	left cracked open	closed halfway	closed tightly	
13	1019	C	The proper oil inlet temperature for centrifuging lube oil should be _____.	100° to 120°F (37.8° - 48.9°C)	130° to 150°F (54.4° - 65.5°C)	160° to 180°F (71.1° - 82.2°C)	190° to 210°F (87.7° - 98.9°C)	
13	1020	B	A disk-type centrifuge is set up for continuous use on the main turbine lube oil system. In order to batch centrifuge a small quantity of diesel oil from a storage tank, _____.	the speed of the centrifuge must be increased	another centrifuge should be used to avoid the possibility of contaminating the main lube oil system	the number of conical disks must be increased	the feed temperature must be decreased to 170°F	
13	1021	C	A rotor position micrometer measures rotor _____.	radial position relative to the casing	radial position relative to the micrometer	axial position relative to the casing	axial position relative to the micrometer	
13	1022	A	Which of the listed methods can be used to blowdown a boiler without securing the fires?	Steam drum surface blow.	Bottom blow from the mud drum.	Blowdown the rear water wall header.	Blowdown the front water wall header.	
13	1023	B	Scavenging air pressure is provided to the steam soot blowers to _____. I. keep steam from accumulating in the soot blowing element while another element is being operated II. prevent corrosive combustion gases from entering the elements when the system is secured	I only	II only	Both I and II	Neither I nor II	

13	1024	B	Coast Guard Regulations (46 CFR) state that the temperature of the water for a hydrostatic test on a fire-tube boiler will be not less than 70° and not more than _____.	90°F	100°F	130°F	160°F	
13	1025	B	Which of the conditions listed could prevent a centrifugal condensate pump from developing its rated capacity?	Venting the pump to the vacuum side of the condenser.	Closing the water seal line to the packing gland.	Flooding of the main condenser hotwell.	Operating the pump with a positive suction head.	
13	1026	B	As lube oil absorbs moisture its dielectric strength can be expected to _____.	remain the same	decrease	increase with an increase in viscosity	increase with a decrease in viscosity	
13	1027	C	Using an oil temperature-viscosity chart, you can determine the recommended _____.	fuel oil flash point for best combustion	fuel/air ratio for efficient combustion	oil temperature for proper atomization	oil pressure for smokeless operation	
13	1028	C	While standing your engine room watch at sea, you notice the D.C. heater level is gradually dropping as indicated by the remote level indicator. Which of the following actions should you take?	Do nothing as this is a common marine plant occurrence.	Immediately open the automatic make-up feed bypass valve.	Check the condensate level in both the main and auxiliary condenser hotwells.	Immediately stop the main engine.	
13	1029	A	What steps should be taken if large quantities of fuel oil are found in the drain inspection tank?	Change over to the standby fuel oil heater.	Open steam trap bypass of the fuel oil heater that is on line.	Secure the lube oil purifier and its associated heater.	All of the above	
13	1030	A	After starting the main lube oil pump in a gravity-type lube oil system, you should verify that the gravity tanks are full by _____.	looking at the overflow sight glass	sounding the gravity tanks	sounding the lube oil sump	observing the flow from the bearings	
13	1031	A	Journal bearings used with modern turbine rotors are manufactured in two halves in order to _____.	permit removal of the bearing without removing the rotor from the turbine	facilitate interchanging with other bearing halves	maintain axial alignment and reduce thrust	provide for positive oil flow at all loads	
13	1032	D	The boiler gage glasses should be periodically blowndown to _____.	test the feedwater stop-check valve	provide water samples for the second assistant	maintain the proper water level in the steam drum	remove any sediment from the glass	
13	1033	C	Which of the following conditions must be carried out before the superheating of saturated steam can occur in a boiler?	The firing rate of the boiler must be increased.	The flow of feedwater to the boiler must be increased.	The steam must be removed from contact with the water from which it was generated.	The boiler pressure must be raised.	
13	1034	B	The main condenser is losing 2" Hg vacuum every 5 minutes. In an hour, the absolute pressure will have increased by approximately _____.	6 psia	12 psia	16 psia	24 psia	
13	1035	B	Air in the main condenser is harmful because it will _____.	decrease the turbine exhaust steam pressure	decrease the vacuum in the main condenser	cause heat to be transferred too rapidly	cause the turbine casing to warp and bow	

13	1036	B	The relieving pressure of the superheater safety valves is permitted to be reset without exchanging the valves when the working pressure of the boilers is _____. I. increased II. Decreased	I only	II only	Both I and II	Neither I nor II	
13	1037	C	Bunker "C" fuel oil is heated prior to atomization to _____.	increase the heating value	increase its specific gravity	reduce its viscosity	reduce the flash point	
13	1038	D	Which of the conditions listed can cause the crackling sound of a water hammer?	Steam rushing over the water in a pipe, resulting in the sudden change of steam bubbles rupturing on the internal surface.	The pressure of the steam striking a wave of water moving through the pipe in the opposite direction.	The rapid expansion of water passing through a pipe and flashing into steam as a result of the constant pressure drop.	The flow of high velocity steam entrained with drops of water, striking another wave of water or piping bend in the system with considerable force.	
13	1039	D	A back pressure trip on an auxiliary turbine functions to secure the device if the _____.	oil pressure is too low	discharge pressure of a turbine driven pump is excessive	gland seal leakoff pressure is too high	exhaust pressure rises above a preset limit	
13	1040	D	Which of the listed order of valves represents the proper installation of the main feedwater supply line to a marine propulsion boiler?	Regulator, stop, stop-check	Stop-check, stop, regulator	Stop, regulator, stop-check	Stop-check, regulator, stop	
13	1041	C	How is the axial clearance indicator used on a turbine?	The axial clearance indicator is inserted in the depth gauge well until it rests on the reference boss, and the reading is noted.	After the axial clearance indicator is screwed into contact with the rotor, shims are placed in the clearance well, and the thickness is measured.	The arm of the axial clearance indicator is pushed so contact is made with a rotor, and the reading on the scale is noted.	A bridge gauge is placed across the bearing, and the gap between bridge and rotor is measured by the axial clearance indicator.	
13	1042	A	The boiler water gage glasses should be blown down _____.	when you are in doubt about the water level	twice each day on the midnight and afternoon watches	every 12 hours of steady boiler steaming operation	when the boiler water level changes in a steaming boiler	
13	1043	D	Which of the listed items are the two most commonly used opposing forces involved in the operation of a constant pressure feed pump governor?	Steam inlet pressure and pump discharge pressure.	Pilot valve steam pressure and control valve spring pressure.	Steam inlet pressure and adjusting spring tension.	Pump discharge pressure and adjusting spring compression.	
13	1044	D	According to Coast Guard Regulations (46 CFR), what action should be taken if the metal thickness of a marine boiler is found to be thinner than original specifications?	Affected areas should be built up by welding.	Boiler should be condemned.	Drum should be renewed before the next biennial inspection.	Working pressure should be recalculated.	

13	1045	B	If the condensate in the loop seal of the intercondenser is lost, _____.	no condensate will flow through the system	some air will be drawn into the main condenser	the air ejector will not operate	the air ejector will become overheated	
13	1046	A	The boiler feedwater regulating valve will vary the unity relationship between steam flow and feedwater flow during _____. I. changes in load II. continuous periods of overload operation	I only	II only	Both I and II	Neither I nor II	
13	1047	A	The Butterworth heater (tank cleaning heater) shown in the illustration is designed to operate at a nominal steam pressure of approximately _____.	130 psi	140 psi	143 psi	850 psi	SG-0005
13	1048	A	Fuel oil is heated before atomizing to _____.	reduce the viscosity	increase the viscosity	raise the fire point	lower the flash point	
13	1049	D	46 CFR requires that _____.	the OCMI be notified of repairs to boilers and unfired pressure vessels	the fuel burned in boilers of tankships shall have a flash point of not less than 140°F	a half-pint sample of each load of fuel be drawn and sealed at the time of supply and preserved until that fuel is exhausted	all of the above	
13	1050	B	Water circulation in a water-tube boiler is a result of the _____.	difference between the area and length of the water-tubes	differences in density within the circulated water	velocity added to the water by the feed pump	siphon action of steam leaving the drum	
13	1051	B	Properly filing the ends of carbon ring segments removed from a turbine gland will _____.	reduce the ring segment end clearance	reduce the clearance between the assembled ring segments and shaft	increase the possibility of steam leakage past the rings	increase the possibility of air leakage into the turbine	
13	1052	B	To properly blowdown a boiler gage glass, you should _____.	blow through the top (steam) connection first	blow through the bottom (water) connection first	never disconnect the chains that connect the upper and lower gage glass packing nuts prior to blowing down	take up snugly on upper and lower gage glass packing nuts prior to blowing down	
13	1054	C	Coast Guard Regulations (46 CFR) state that a marine inspector may require a boiler to be drilled or gaged to determine actual thickness _____.	at the first inspection for certification	to preclude nondestructive testing methods	at any time its safety is in doubt	when boiler drum thickness has decreased by 5%	
13	1055	B	Noise caused by condensate striking bends or fittings in a pipe line is called _____.	condensate depression	water hammer	piston slap	hydraulic lock	
13	1056	B	Prior to taking on bunkers in a deep tank previously used to carry dry cargo, you should _____.	test the fixed fire extinguishing system in that tank	inspect and test the tank heating coils for damage	install a quick-closing valve in the sounding tube	chemically clean and gas free the tank	

13	1057	C	The double bottom tanks on your vessel are used to store heavy fuel oil. In general, there are six sets of tanks with the port/starboard outboard tanks being an average 33% to 50% capacity smaller than the port/starboard centerline tanks. Also, the tanks forward are smaller than those aft, with the 3's and 5's being relatively the largest double bottoms. In general, with a minimum amount of fuel oil on board, the bunkering process should be to fill the _____.	aft tanks, then the midship tanks, finally all forward tanks to use the increase in pressure to force the oncoming fuel forward	forward tanks, then the 3's and 5's, and finish with the aft tanks moving successively aft to bring the draft at the bow down as quickly as possible	forward tanks, then fill the aft tanks, and complete the bunkering by filling the outboard then centerline 3's and 5's to avoid high pressure in static overflow leg	forward then the aft tanks, and completing the process by filling the centerline, then the outboard 3's and 5's, as small tanks are easier to control when topping off	
13	1058	A	The primary purpose of the heater used in a pressurized fuel oil system is to _____.	reduce fuel oil viscosity for proper atomization	reduce fuel oil specific gravity for better combustion	increase the fire point of the fuel oil	improve the flash point of the fuel oil	
13	1059	A	To test an automatic low lube oil pressure trip on an idling turbogenerator and at the same time prevent the chance of bearing damage, you should _____.	secure the steam supply valve to the throttle valve and observe the lube oil pressure reading when the throttle trips, while ensuring an adequate supply of oil with the hand or standby pump as the generator idles to a stop or drops below 3 psi .	ensure the standby lube oil pump, if so equipped, is properly lined up and set in the "auto" mode, or the hand pump is being operated and then actuate the emergency trip	close the generator steam throttle valve and then ensure a supply of oil through the hand or standby pump when the pressure drops to 5-6 psi .	actuate the overspeed trip, making a note at what pressure the oil is dumped from under the operating piston	
13	1060	D	Coast Guard Regulations (46 CFR) state that main propulsion water-tube boilers are required to be fitted with a surface blow off valve if the design pressure is _____.	less than 200 psig (1436 kPa)	less than 250 psig (1795 kPa)	less than 300 psig (2169 kPa)	less than 350 psig (2513 kPa)	
13	1061	A	On a main propulsion turbine bearing, the readings obtained with a bridge gage represent the _____.	oil clearance and bearing wear	babbitt thickness	diaphragm tip clearance	blade axial clearance	
13	1062	B	If the engineer on watch has reason to doubt the accuracy of the water level showing in the boiler gage glass, he should FIRST _____.	open the auxiliary feed line	blowdown the gage glass	replace the gage glass	start the standby feed pump	
13	1064	C	According to Coast Guard Regulations (46 CFR), what is the highest steam temperature to which fusible plugs may be exposed?	290°F	375°F	425°F	500°F	
13	1065	D	Decreasing condensor vacuum is found to be caused by a loss of the condensate loop seal. To reestablish the loop seal, you should _____.	crack open the recirculating line from the DC heater to the condenser hotwell	close in on the recirculating line from the DC heater to the condenser hotwell	bypass the regulating valve in the condensate recirculating line until the loop refills	close the loop seal valve until the loop refills and reopen slowly	

13	1066	D	While on watch aboard a 900 psi (6.2 MPa) steam vessel, you suddenly hear a loud, piercing, high-pitched noise. Which of the following actions should you take?	Vacate everyone from the engine room immediately, as this is the preliminary signal that CO2 is about to be released.	Rapidly move towards the direction of the noise to investigate the probable source.	Cautiously move towards the source of the noise, sweeping the beam of your flash light ahead of you.	Move away from the noise to find a broom, then cautiously advance, sweeping the handle ahead of you to locate the source.	
13	1067	C	According to Coast Guard Regulations (46 CFR), fusible plugs are not permitted where the maximum steam temperature to which they are exposed exceeds _____.	206°F	218°F	425°F	850°F	
13	1068	B	Fuel oil is heated before it reaches the burners to _____.	increase its heating ability	make it atomize properly	raise its ignition temperature	boil off water contamination	
13	1069	A	Routine maintenance of boiler sliding feet should include _____.	wire brushing to remove scale, rust, and dirt	torquing retaining bolts on the stationary base	removing all grease from around the bolts	painting the sliding surfaces to prevent corrsion	
13	1070	A	If the bellows in a thermo-hydraulic feedwater control valve ruptures, the boiler water level will _____.	decrease only	increase only	decrease initially and then increase	increase initially and then decrease	
13	1071	D	Which of the devices listed can be used to determine bearing wear on a main propulsion turbine bearing?	Bridge gage	Soft lead wires	Micrometer depth gages	All of the above.	
13	1072	B	Steam baffles are installed in the steam drum of a water-tube boiler to _____.	direct the flow of steam to the desuperheater inlet	reduce the possibilities of carryover	prevent water return	increase the velocity of the steam and water mixture	
13	1073	B	Excessively hot water returning to an atmospheric drain tank indicates _____.	a heating coil has ruptured	a steam trap is hung open	there is a loss of circulating water	the condensate recirculating valve is open	
13	1074	C	During an inspection of the main turbine, you notice flow marks or discoloration across the diaphragm joints. This condition indicates _____.	normal wear for a high temperature unit	water carryover between stages	improper seating of the diaphragm joint	excessive chemical treatment of the boiler water	
13	1075	A	While a vessel is underway, one of the FIRST indications of the failure of the gland leakoff exhaust fan motor is _____.	excessive steam leakage at the turbine glands	loss of vacume at the turbine	increased turbine exhaust temperature	water knock on the turbin gland steam header	
13	1076	C	During a maintenance inspection of a turbogenerator, the integral turbine wheels are tapped with a hammer. What condition may be indicated by a dead sound?	Improper rotor support	Overstressed blade shrouding	A cracked turbine wheel	Normal structural solidity	
13	1077	B	All oil-fired main propulsion burners with automatic safety control systems must automatically close the burner valve when_____.	flame in boiler furnace is confirmed	actuated by boiler safety trip	burner is properly seated	starting trial for ignition occurs	

13	1078	C	Steam drains from fuel oil heating coils can be returned to the condensate and feedwater system _____.	through a direct connection to the heating drain header	through a vacuum drag line connection to the fuel heater	after being collected in the drain inspection tank	after first passing through the DC heater	
13	1079	D	All oil-fired main propulsion burners with automatic safety control systems must automatically close the burner valve when _____.	the flame in boiler furnace is confirmed	starting "trial for ignition"	the burner is properly seated	actuated by a boiler safety trip	
13	1080	A	According to Coast Guard Regulations, bolier safety valves _____.	shall not have valves on drain lines	will only be set and sealed by the Chief Engineer	will be provided with a suitable lifting device operated only from the fireroom	all of the above	
13	1081	B	A bridge gage is used to measure _____.	blade tip leakage	rotor bearing wear	axial clearances	thrust bearing wear	
13	1082	B	The main feed check valve functions to _____.	check pressure pulsations in the feed line	prevent backflow of water from the boiler in the event of a feed pump failure	provide feed pump positive discharge head	reduce feed pump discharge pressure loading	
13	1083	C	All oil-fired main boiler burners with automatic safety control systems must be provided with_____.	a modulating pressuretrol, sensing both steam and temperature	a pyrostat measuring decreased steam temperature	one flame detector per burner	an electrode sensing high water level	
13	1084	D	Which normally closed valve would have to be at least partially open prior to actually lighting off a cold boiler as shown in the illustration?	C	D	F	J	SG-0009
13	1085	A	A malfunction in the DC heater is indicated by _____.	the boiler requiring excessive amounts of oxygen scavenging chemicals	water and steam entering the DC heater at different temperatures	condensate coming in contact with steam inside the heater	air flowing from vent condenser vent	
13	1086	D	While standing watch in the engine room of a steam vessel while at normal sea speed, you notice that the condensate temperature outlet of the air ejector condenser is fluctuating by approximately 12°F. You should therefore _____.	call the Chief Engineer immediately	only need to log the temperature and inform the watch engineer who will relieve you	only need to add make-up feed to the system	first determine whether the main condenser level is normal and steady	

13	1087	B	While standing watch in the engine room, power is suddenly lost, but the main breaker has been observed to not have 'tripped' with the on line generator still running. As the watch engineer you should_____.	attempt to re-establish power with the 'on-line' generator	start up the stand by generator and trip the breaker to the 'on-line' generator, before attempting to place the stand-by generator on line	only need to trip all non-critial breakers before trying to re-establish power	standby for orders from the bridge	
13	1088	B	When securing a fuel oil heater you should _____.	open the fuel oil temperature regulator bypass, widely	cut out the steam before securing the oil flow	stop the oil flow and then cut out the steam	remove all fuel oil pressure from the system by securing the service pump	
13	1089	D	While standing watch in the engine room, power is suddenly lost, but the main breaker has been observed to not have 'tripped'. The standby generator has automatically started, but when attempting to parallel it with the 'on-line unit' the synchroscope begins to rotate counterclockwise the more you increase generator speed. As the watch engineer you should_____.	attempt to re-establish power with the 'on-line' generator	standby for orders from the bridge	trip all non-critial breakers before trying to re-establish power	trip the 'on-line' generator and its breaker, before attempting to place the stand-by generator on line	
13	1090	C	Why are two fuel oil heaters "E" provided in the fuel oil system shown in the illustration?	Each heater supplies fuel to a different boiler.	To allow fuel of different temperatures to be provided to be provided to each boiler.	To provide a backup in case one of the heaters becomes inoperable.	To provide series operation at high firing rates.	SG-0009
13	1091	B	Thrust clearances indicated on a main propulsion turbine bearing clearance diagram are _____.	normal clearances for operation under routine steaming conditions	cold clearances to which the bearing was initially set	minimum clearances that indicate when bearing renewal is necessary	maximum clearances which should not be exceeded when the turbine is warmed up	
13	1092	C	On a boiler equipped with pilot actuated safety valves, which of the valves listed will be actuated first?	Drum safety valve	Superheater safety valve	Pilot actuated safety valve for the superheater safety valve	Pilot actuated safety valve for the drum safety valve	
13	1093	C	Standing watch underway at sea in the engine room there is a complete loss of electrical power. When power is restored, the steering gear pump motor will_____.	have to be restarted from the steering gear room	have to be reset before restarting	restart automatically	trip via the overload relay	
13	1094	B	While standing watch underway in the engineroom, failure of the normal power supply will cause the emergency generator to be placed on the line by the _____.	main bus tie feeder	automatic bus transfer device	line connection feeder	power failure alarm bus	

13	1095	C	Excessive condensate depression can result in _____.	overheated air injectors	high condensate discharge temperature	decreased plant operating efficiency	insufficient condensate subcooling	
13	1097	A	While on watch at sea with only one ship's service turbogenerator on line, the entire plant suddenly blacks out without warning. After restoring power, which of the following faults would most likely have attributed to this casualty?	The turbogenerator throttle valve position "micro switch" vibrated open, allowing the main breaker to trip open according to its protection circuitry.	Someone pushed the trip button to the 'shore power' breaker.	The main air compresser suddenly stopped.	The standby generator started automatically and became motorized.	
13	1098	D	The fins on the tubes of a fin type fuel oil heater are provided to _____.	clean the fuel oil	prevent tube erosion	decrease fuel flow	increase heater efficiency	
13	1099	B	While underway at sea, a mechanical malfunction in one of the ship's service generators operating in parallel, requires that you must secure that generator. In order to prevent a possible overload to the remaining generator, which of the following sequential courses of action should be taken?	Trip the malfunctioning generator's circuit breaker and prime mover throttle trip.	Trip all nonvital distribution feeder circuit breakers, decrease the load on that generator using the governor, trip the malfunctioning generator's circuit breaker, and trip the prime mover throttle.	Trip the malfunctioning generator's circuit breaker and distribution feeder circuit breakers.	Trip all nonvital distribution feeder circuit breakers, the malfunctioning prime mover turbine throttle trip, and the generator circuit breaker.	
13	1101	B	The thrust bearing wear on a turbine may be determined by checking the _____.	bearing drop	rotor axial position	rotor expansion rate	casing movement	
13	1102	C	One of the important functions of the superheater safety valves is to _____.	maintain a constant steam flow in the desuperheater	protect the desuperheater from overheating	protect the superheater from overheating	maintain a constant steam flow in the auxiliary steam line	
13	1103	C	While standing watch in the engine room which of the following actions should be taken to reestablish a 'blown' air ejector loop seal?	Decrease the steam pressure to the air ejector nozzels.	Shut off the steam to the second stage air ejector momentarily then open it again.	Momentarily close the valve in the loop seal line, then reopen slowly.	Increase the condensate flow through the air ejector.	
13	1104	D	While underway, the boiler water level in a steaming boiler begins dropping rapidly and cannot be kept at the normal level by standard practices. As the watch engineer you should _____.	continue to speed up the feed pump to raise the water level	blowdown the gage glass to find the true water level	secure the steam stop and then secure the fires	secure the fires and then secure the feed stop to the boiler	

13	1105	D	Excessive condensate depression will result in _____.	increased oxygen rejected in the condenser	decreased steam consumption	excessive condensate temperatures	increased air absorption by the condensate	
13	1106	A	While on watch in the engine room and steaming at a steady rate, the water level begins to decrease and suddenly drops out of sight in the boiler gage glass. Your FIRST corrective action should be to _____.	secure the fires	slow down the engines	blowdown the boiler gage glass	open the feedwater regulator bypass	
13	1107	B	The consideration that is MOST important when determining the minimum temperature of fuel oil in storage tanks is the _____.	fire point of the oil	pumpability of the oil	expansion of the oil	size of the vents	
13	1108	A	You are standing watch in the engine room of a steam vessel. You should blow down a gage glass periodically to _____.	remove any sediment that has accumulated	maintain the proper water level in the steam drum	provide water samples for the second assistant	test the feedwater stop-check valve	
13	1109	D	You are standing watch in the engine room of a steam vessel. If the entire pneumatic control to a multi-element feedwater regulator fails, the feedwater valve can be controlled by the _____.	constant pump pressure regulator	remote manual control regulator	single-element feedwater regulator	local manual hand control	
13	1110	B	While underway on watch in the engine room of a steam vessel, the proper valve positions for controlling feedwater to the boiler using the auxiliary feed system should be _____.	the auxiliary check valve fully open and the stop valve used to regulate the amount of flow	the stop valve fully open and the auxiliary check valve used to regulate the amount of flow	the stop and check valves fully open and the feed pump speed used to regulate the amount of flow	the check valve fully open and the stop valve regulated by the feedwater regulator	
13	1111	D	In order to operate the main engine with only the high pressure turbine in service, the unit should be arranged _____.	to secure only the gland sealing steam to the low pressure turbine	with a blank installed in the high pressure turbine steam inlet	with the valve closed in the crossover pipe between the high pressure and low pressure turbine	with the high pressure turbine exhausting directly to the main condenser	
13	1112	A	If a boiler superheater safety valve is leaking at normal working pressure, the quickest method of determining and possibly solving the problem is to _____.	blow out the valve by several short lifts with the hand lifting gear	fully open the superheater safety drain valve for several seconds	lower the firing rate until the leakage stops	raise the firing rate until the leakage stops	
13	1113	A	Your main propulsion boilers are equipped with a two element feedwater regulating control system. While on watch, you are required to respond to a 'stop' bell from full sea speed. With the shaft now stopped, the automatic feedwater regulator will have _____.	closed down on the feedwater valve due to the decrease in steam flow demand	opened the feedwater valve wide due to the effect of shrink	partially closed down on the feedwater valve due to the effect of swell	fully opened the feedwater valve due to the increase in steam flow	
13	1114	C	You are standing watch in the engine room of a steam vessel. Fine adjustments to a boiler combustion control system, to bring about near perfect combustion, should be made by manually adjusting the _____.	fuel oil back pressure	air volume regulators	fuel/air ratio knob	forced draft fan damper positions	

13	1115	C	On a steam vessel, if a centrifugal main feed pump were operating at shutoff head with the recirculating line closed, which of the following conditions could occur?	Water level in the DC heater would decrease.	An increased water level in the steam drum.	Flashing at the suction side of the pump.	Excessive diaphragm seal wear in the feedwater regulator.	
13	1116	D	During initial starting of the standby turbine-driven boiler feed pump, which of the listed valves should remain closed?	Turbine exhaust valve	Turbine steam supply valve	Pump suction valve	Pump discharge check valve	
13	1117	D	Fuel oil settling tanks are used to _____.	store oil for immediate use	precipitate out water and solids	facilitate the stripping of sludge and water	all of the above	
13	1118	C	In the majority of marine power plants, the fuel oil heater installations are divided into several units because _____.	more heating is required for lower loads	auxiliary steam is better utilized in this system	proper plant operation can be continued while repairs are made	oil leakage into the condensate system is less likely with this system	
13	1119	D	While standing watch in the engine room you hear a 'crackling' sound coming from within a general service system centrifugal pump. The most probable cause for this occurrence would be due to an abnormal condition at the _____.	shaft sleeves	discharge volutes	wearing rings	pump suction	
13	1120	C	If you hear a 'crackling' sound coming from a salt water centrifugal pump casing, the most probable cause of the noise would be _____.	insufficient packing	an oversized lantern ring	excessive suction lift	reversed pump rotation	
13	1121	A	While a vessel is underway the low pressure turbine high-speed pinion is damaged. The pinion is then removed from the gear train. Under these circumstances, the main unit is capable of which speed and direction?	Reduced speed ahead only	Reduced speed astern only	Reduced speed ahead and full speed astern	Reduced speed astern and full speed ahead	
13	1122	C	Which of the conditions will occur FIRST if the steam flow to the main engine, from a boiler with mechanical atomization, when at full power is suddenly stopped?	Drum safety valves will open.	Dual element automatic feedwater regulator will admit additional water to compensate for shrinkage.	Superheater safety valve will open.	Combustion control system will automatically secure all of the burners.	
13	1123	B	If you hear a 'crackling' sound coming from a salt water centrifugal pump casing, the most probable cause of the noise would be _____.	insufficient speed	cavitation	excessive discharge pressure	excessive net positive suction head	
13	1124	A	According to Coast Guard Regulations (46 CFR), which of the following steam piping conditions, subjected to main boiler pressure, is exempted from hydrostatic testing?	All piping with a nominal size of 3 inches or less.	All piping from the main steam stop to the throttle valve.	All piping to the ship's service generators.	All piping equipped with a safety or relief valve.	

13	1125	C	Which of the conditions listed should be immediately reported to the engineering officer on watch?	Steam leaving the vent of the gland exhaust condenser.	Lube oil passing through the bull's eye of the gravity tank overflow line.	Oil in the drain inspection tank.	Water trickling in through the stern gland.	
13	1126	A	The usual symptoms of cavitation in a centrifugal pump would be _____.	noise and vibration	an increase in discharge pressure	an increase in suction pressure	lifting of the relief valve	
13	1127	A	Cavitation is a term commonly used with centrifugal pumps to describe _____.	the formation and subsequent collapse of vapor pockets in the impeller	excessive clearances produced on the impeller wearing rings	the laminar flow of the fluid being pumped	water hammer in the pump suction line	
13	1128	A	The advantage of a counterflow fuel oil heater, as compared to a parallel flow fuel oil heater, is that the counterflow heater _____.	produces a higher oil temperature at any given steam temperature	has a larger heat transfer area providing greater heat transfer	has thinner tube walls providing greater heat transfer	is not subject to coking if overheated	
13	1129	B	While underway at sea, one of three available centrifugal salt water service pumps is in operation with a sea water temperature of 50°F. The operating temperature of all the systems supplied by this pump appear to be high. Your next proper course of action would be to _____.	start a second pump and operate it in parallel	start a second pump and place it on line, close the discharge valve on the original pump and watch for a rise in the discharge pressure	start the second pump, open the casing vent valve of the first pump, then secure the first pump	start the second pump, secure the first pump and do nothing else with the salt water service system	
13	1130	D	On watch aboard ship, which of the following conditions will prevent a general service shipboard pump from achieving its maximum suction lift?	Leaks developed in the suction piping.	Friction losses as a result of improperly sized pipe.	Gases or vapors released in the liquid as a result of greater than normal pressure drops.	All of the above.	
13	1131	D	During an inspection of the main turbine, you notice flow marks or discoloration across the diaphragm joints. This condition indicates _____.	water carryover between stages	normal wear for a high temperature unit	excessive chemical treatment of the boiler water	improper seating of the diaphragm joint	
13	1132	B	Standing watch in the engine room, what would be the result of throttling the suction valve on a general service centrifugal pump to the point where the flow was less than that recommended by the manufacturer? I. The designed discharge head would be reduced. II. The packing life would be reduced.	I only	II only	Both I and II	Neither I nor II	

13	1134	D	When conducting a hydrostatic test of a boiler, Coast Guard Regulations (46 CFR) prohibit _____.	gagging the safeties	removing the safety valves in order to perform the hydrostatic test	a test pressure of less than 1 1/2 times the maximum allowable working pressure if testing a water-tube boiler	the auxiliary stop valve from simultaneously having hydrostatic pressure on one side of the valve and steam pressure on the other side	
13	1135	A	Excessive recirculation of condensate should be avoided, as it can cause _____.	excessive cooling of the condensate	overheating of the air ejectors	the condenser hotwell to be completely drained at low speeds	overheating of the vent condenser	
13	1137	D	The results of a flue gas analysis indicate a very high percentage of oxygen, and a low percentage of carbon dioxide. This condition coincides with which area on the graph shown in the illustration?	A	B and C	D	E	SG-0021
13	1138	C	The boiler fuel oil service pump takes suction from the _____.	fuel oil heater discharge	contaminated drain inspection tank	fuel oil settler tank	double bottom fuel tanks	
13	1139	A	If a severe leak develops in the electro-hydraulic steering gear, which of the listed conditions could result?	Loss of vessel steering	Overheating of the gyrocompass	Jamming of the six-way valve	Jamming of the follow-up device	
13	1141	D	Which of the following construction methods would apply to the babbitt lined, split-type, reduction gear bearings?	They are always mounted with the split in a horizontal plane.	They are secured in their housing so pressure points will occur at the joint faces.	They are split into four equal sized segments.	They are rigidly mounted and dowelled in their housings.	
13	1143	B	A power failure in the hydraulic system of a compact type steering gear would cause the rudder to _____.	swing 35° right or left	remain locked in its last position	move to the midship position automatically	jam against the rudder emergency stops	
13	1144	D	Coast Guard Regulations (46 CFR) require that the final setting of boiler safety valves be conducted in presence of the _____.	Chief Engineer	COTP	OCMI	Marine Inspector	
13	1145	C	If the main condenser were operating at a vacuum of 28.5"Hg, a condensate discharge temperature of 88°F, a seawater inlet temperature of 72°F, and a seawater outlet temperature of 79°F, what would be the condensate depression?	0.2 inches Hg	0.3 inches Hg	4.0 degrees Fahrenheit	12 degrees Fahrenheit	SG-0004
13	1146	B	Air trapped in the hydraulic fluid of a steering system would be indicated by _____.	the pump overspeeding	erratic rudder response	bubbles in the sight glass	ram relief valves lifting	

13	1147	C	Results of the flue gas analysis indicate a high percentage of carbon dioxide and a low percentage of carbon monoxide, approaching maximum efficiency. This condition coincides with which area(s) on the graph shown in the illustration?	A	D	B and C	E	SG-0021
13	1148	B	Which of the pumps listed takes fuel oil suction from the double bottom tanks and discharges it to the settling tanks?	Fuel oil service pump	Fuel oil transfer pump	Centrifugal type general service pump	Settler service pump	
13	1149	D	Air trapped in the hydraulic fluid of a steering system would be indicated by _____.	an improper rudder response	hammering noises in the equipment or transmission lines	popping or sputtering noises	all the above	
13	1150	A	When air becomes trapped in the hydraulic fluid of a steering system, the _____.	rudder will respond erratically	hydraulic ram movement will overspeed	sight glass will show bubbles	ram relief valves will lift	
13	1151	C	Which of the following conditions is indicated by the necessity of providing excessive gland sealing steam pressure to maintain the normal operating conditions of the main propulsion unit?	Vacuum leak in the condenser shell.	Flooded main condenser hotwell.	Worn or damaged labyrinth packing.	Restriction in the gland leak off piping.	
13	1152	D	Damaging scale can form on the interior of superheater tubes as a result of _____.	leaks from the desuperheater	high superheater outlet temperature	insufficient steam flow through the superheater	boiler water carryover	
13	1153	D	While standing watch in the engine room, irregular feeding or surging of the feedwater supply to a flash evaporator may be attributed to _____.	erratic water flow through the air eductor	a clogged vent line from the air eductor condenser	excessive pressure in the seawater feed heater	a dirty strainer in the saltwater feed pump suction line	
13	1154	B	Salinity cells are strategically installed in distilling units to indicate the _____.	quanity of the distillate produced	quality of the distillate produced	presence of leaks in the flash chambers	all of the above	
13	1155	B	While underway on watch, you notice that you need to constantly increase the coil pressure in the high pressure contaminated evaporator to maintain capacity. Which of the following may be the cause?	The brine density is improper.	The heating transfer surfaces are being layered with scale.	Impure distillate is being produced.	Shell vapor pressure is constantly decreasing.	
13	1156	D	If the rated distillate production of a submerged tube type evaporator cannot be maintained with the supplied maximum steam pressure, the evaporator _____.	chemical feed must be increased	has a serious brine leak	temperature switch is defective	heating surfaces are scaled	
13	1157	A	Results of the flue gas analysis indicate a high percentage of carbon monoxide and an extremely low percentage of carbon dioxide. This condition coincides with which area on the graph shown in the illustration?	A	B and C	D	E	SG-0021

13	1158	B	Which of the following statements is true concerning the operation of the solenoid valve in the fuel oil manifold of an automatically fired boiler?	The valve should secure the fires if the main propulsion turbine overspeeds.	The valve must be manually reset to the open position prior to relighting burners.	The valve will automatically reopen from a low water shutdown once water level is restored.	The valve will automatically close if atomizing steam pressure varies more than 2 psig.		
13	1159	C	Indicated high salinity of the distillate discharged from a flash-type distilling plant will be a result of _____.	operating at reduced vacuum conditions	carrying the brine level below normal	leaks in the demister baffles	reduced feedwater heater temperatures		
13	1160	C	If a higher than normal water level is observed through the inspection port of a flash evaporator, you should suspect _____.	a leak in the feedwater heater	improper vacuum	a malfunctioning brine pump	a clogged desuperheater water strainer		
13	1161	C	Which of the following statements about gravity type lube oil systems is correct?	Any lube oil pump failure causes immediate damage to turbine bearings.	The discharge from the gravity tanks flows to the lube oil pump suction.	Gravity tank overflow lines are lead directly to the lube oil sump.	Gravity tanks are fitted with an overflow alarm.		
13	1162	B	Why are scale deposits on the inside of boiler tubes objectionable?	Flow of water within the tube is restricted.	Poor heat transfer due to scale deposits overheats tubes.	The metal of the tube interior is eaten away by scale.	Hydroxyl ions liberated by the scaling process form acid in the boiler water.		
13	1163	C	An excessively high brine level in a flash evaporator can be caused by _____.	excessive vacuum in the first effect shell	an excessive brine blowdown rate	failure of the brine pump	excessive distillate pump speed		
13	1164	D	While standing watch in the engine room, if you suspect air leaking into a flash type distilling plant. The most probable cause(s) of the air leak could occur through _____.	gasketed joints	valve stems	gage glass packing	all of the above		
13	1165	D	While standing watch in the engine room, you notice a high reading at a salinity cell located in the loop seal between two stages of a flash type evaporator. This would indicate _____.	chill shocking is necessary to remove scale	leakage at the second-stage condenser	faulty operation of the brine overboard pump	carryover in the first-stage		
13	1166	B	Standing watch in the engine room, a high reading is only indicated at the salinity cell labeled "6" shown in the illustration. This would be the probable result of _____.	a minor tube leak in the distillate condenser in section III	a faulty cell at this location	the compensating temperature is set too low for this cell location	All of the above	GS-0053	
13	1167	A	While standing watch underway at sea, you notice carryover in a flash type distilling plant. This can be a result of _____.	faulty operation of the brine overboard pump	a pressure drop through the loop seal	low first stage vacuum	low distillate conductivity		
13	1168	C	A solenoid valve in the boiler fuel oil supply line will close when the _____.	main turbine throttle valve is closed	boiler is operating at low pressures	forced draft fan fails	fuel oil temperature exceeds 150°F		

13	1169	B	While standing watch underway at sea, you notice that the brine level in the second effect of a double effect soloshell evaporator is nearly out the top of the sight glass. Which action should be taken initially?	The feed rate should be increased to the first effect.	The feed rate should be reduced and the brine discharge valve opened slightly.	The brine overflow weir should be raised to allow greater outflow.	The brine section should be drained down a minimum of 6 inches below the seawater heater bundle.	
13	1170	C	Prior to relieving the watch you should first check the fireroom status by verifying the boiler water level and _____.	prepare to blow tubes	economizer inlet temperature	boiler steam pressure	port and starboard settling tanks	
13	1171	D	Which of the following types of packing is commonly used to seal the glands of an auxiliary turbine?	Flax	Asbestos	Rubber	Carbon	
13	1172	B	High temperature at the superheater outlet would NOT be caused by _____.	outer casing leakage	high feedwater temperature	poor fuel oil atomization	too much excess air	
13	1173	A	When relieving the watch in the fireroom, you should first check the boiler steam pressure and _____.	boiler water level	prepare to blow tubes	stack temperature	port and starboard settling tanks	
13	1174	B	When relieving the watch in the fireroom, you should first check the boiler water level and _____.	port and starboard settling tank temperatures	condition of furnace fires	steam atomization to the mechanical atomizers	feed pump lube oil level	
13	1175	D	When relieving the watch in the fireroom, you should first check the fuel pressure to the boiler and _____.	port and starboard settling tank levels	economizer outlet temperature	empty all oil drip pans	boiler water level	
13	1176	B	In a gravity type lube oil service system, with no lube oil appearing in the sight flow glass (bull's eye) while underway, is a positive indication of _____.	no oil flowing to the bearings	no oil is overflowing the gravity tank	failure of all lube oil pumps	the gravity tanks being empty	
13	1177	A	Prior to relieving the watch you should first check the fireroom status by verifying the fuel oil pressure to the boilers and _____.	boiler steam pressure	make up feed tank level	prepare to blow tubes	port and starboard settling tanks	
13	1178	C	The fuel oil meter in the fuel oil service system should be bypassed when _____.	transferring fuel from storage to settler tank to avoid erroneous fuel consumption readings	conducting programmed routine maintenance of the meter while underway	warming the oil in the burner headers by recirculation prior to boiler light off	finished with engines is given by the bridge	
13	1179	D	When relieving the watch in the fireroom, you should first check the boiler water level and _____.	the port and starboard settling tank temperatures	make up feed tank level	empty all oil drip pans	the condition of the furnace fires	
13	1180	D	Prior to relieving the watch at sea, you notice black smoke coming from the stack. What would this indicate?	Insufficient excess air	Dirty burner	Soot blowers need to be operated	All of the above	
13	1181	B	When a turbine bearing shows signs of overheating, you should _____.	stop the turbine	immediately reduce speed	increase the lube oil pump discharge pressure	increase the cooling water supply to the lube oil cooler	

13	1182	A	Underway on watch in the fireroom, the bridge reports black smoke coming from the stack. This would indicate _____.	fuel oil temperature too low	excessive steam atomization pressure	excessive air-fuel turbulence	All of the above	
13	1183	B	Underway on watch in the fireroom, the bridge reports white smoke coming from the stack. This would indicate _____.	high fuel oil viscosiity	excessive excess air	low fuel oil temperature	insufficient steam atomization pressure	
13	1184	B	When standing watch at sea, steaming full ahead, reducing the boiler forced draft pressure would also have a tendency to correct which descrepancy?	Low superheat temperature.	High stack temperature.	High atomizing steam pressure.	High DC heater level.	
13	1185	D	While standing watch at sea and steaming full ahead, reducing the boiler forced draft pressure would also have a tendency to correct which descrepancy?	High superheat temperature.	White smoke from the stack.	High stack temperature.	All of the above.	
13	1186	C	The source of metal particles adhering to the magnets in a lube oil strainer is probably from the _____.	shaft journal	bearing shell	reduction gears	babbitt material	
13	1187	A	When standing watch at sea, steaming full ahead, reducing the boiler forced draft pressure would also have a tendency to correct which descrepancy?	High superheat temperature.	Black smoke from the stack.	Low boiler pressure.	High fuel oil temperature.	
13	1188	C	When standing watch at sea, steaming full ahead, reducing the boiler forced draft pressure would also have a tendency to correct which descrepancy?	Low fuel oil temperature.	High desuperheat steam pressure.	White smoke from the stack.	Low furnace air pressure.	
13	1189	D	When standing watch at sea, steaming full ahead, adding make-up feedwater would also have a tendency to change which of the following parameters?	Decrease DC heater pressure.	Increase DC heater level.	Increase condensate depression.	All of the above.	
13	1190	B	When standing watch at sea, steaming full ahead, adding make-up feedwater would also have a tendency to change which of the following parameters?	Increase DC heater pressure.	Increase DC heater level.	Increase boiler water level.	All of the above.	
13	1191	A	If you are notified that one of the turbine bearings is overheated, which of the following actions should you take as the watch engineer?	Immediately reduce speed.	Immediately stop the turbine.	Increase lube oil pump discharge pressure and check the strainer for metal particles.	Increase cooling water supply to the lube oil cooler.	
13	1192	D	Air leaks through the inner or outer casings of a boiler will _____.	improve fuel combustion	decrease stack temperatures	cause boiler panting	reduce boiler efficiency	
13	1193	A	When standing watch at sea, steaming full ahead, adding make-up feedwater would also have a tendency to change which of the following parameters?	Lower DC heater temperature.	Decrease DC heater level.	Increase air ejector condenser main condensate outlet temperature.	All of the above.	

13	1194	A	Coast Guard Regulations (46 CFR) require that new fuel oil service piping between pumps and burners be subjected to _____.	a hydrostatic test of 1.5 times the maximum allowable pressure but not less than 500 psi (3447 kPa)	a hydrostatic test of 1.25 times the maximum allowable pressure with the relief valves closed	spot radiographic examination of portions of the finished weld joints	a hydrostatic leak test to the design pressure specified by the Coast Guard	
13	1195	C	When standing watch at sea, steaming full ahead, adding make-up feedwater from reserve feed double bottom tanks would also have a tendancy to change which of the following parameters?	Increase DC heater temperature.	Decrease DC heater level.	Decrease air ejector condenser main condensate outlet temperature.	Increase main condensate discharge temperature.	
13	1196	A	Excessive water in an operating lube oil system can be detected by _____.	the amount of water discharging from the lube oil purifier	sounding the lube oil settling tank	examining the lube oil strainers	checking oil for unusually low temperature	
13	1197	C	While underway on watch, you notice that you need to constantly increase the coil pressure in the high pressure contaminated evaporator to maintain capacity. Which of the following may be the cause?	The water level is too high.	Excessive distillate is being produced.	The heating coils have excessive scale buildup.	Shell pressure is excessive.	
13	1198	D	Condensate from fuel oil heating coils return to the _____.	feedwater heater	engine room bilge	reserve feed tank	drain inspection tank	
13	1199	C	Operating a steam turbine propulsion unit at medium speed, in an area with extremely cold seawater, and the main circulating pump providing full cooling water flow to the condenser will result in _____.	decreased plant efficiency due to higher attainable vacuum	increased plant efficiency due to increased condensate recirculation	reduced plant efficiency due to excessive condensate depression	increased effectiveness of the air ejectors due to the increased main condenser vacuum	
13	1200	B	To provide emergency feedwater supply to a steaming boiler if it becomes necessary to secure the DC heater, suction should be taken on the distilled water tank using the _____.	emergency injector discharge	emergency feed pump	feed booster pump	main condensate pump	
13	1201	B	The FIRST adverse effect resulting from main bearing wear in an impulse turbine is _____.	wear of radial dummy piston packing strips	wear of gland seal and diaphragm labyrinth packing	loosening of bearing cap bolts	loss of lube oil pressure	
13	1202	B	Operating a steam turbine propulsion unit at medium speed, in an area with extremely cold seawater, with the main circulating pump providing full cooling water flow to the condenser will result in _____.	excellent plant efficiency due to higher attainable vacuum	increased requirements for condensate deaeration	increased effectiveness of the air ejectors due to the increased main condenser vacuum	increased plant efficiency due to increased condensate depression	
13	1203	D	All ships with periodically unattended machinery plants shall, in addition to the general alarm required by Coast Guard Regulations (46 CFR), be provided with a/an _____.	engineer's assistance-needed alarm	accommodation space communication system	personnel alarm	all of the above	

13	1204	B	Which of the following statements represents the Coast Guard Regulation regarding a boiler installation in which the superheater outlet temperature exceeds 850°F?	Safety valves are to be set at 110% of the highest setting of the safety valves on the drum.	Visible and audible alarms indicating excessive superheat shall be provided.	All mountings, fittings, valves, or other superheater attachments must be of malleable cast iron.	A device, actuated by inlet static pressure and designed to function by the bursting of a pressure retaining disk, must be fitted at the outlet of the superheater.	
13	1205	D	All ships with periodically unattended machinery plants shall, in addition to the general alarm required by Coast Guard Regulations (46 CFR), be provided with a/an _____.	accommodation space communication system	engineer's assistance-needed alarm	remote vital system alarm	all of the above	
13	1206	C	The entrance of water into the main propulsion lube oil system is undesirable because _____.	the flash point of the lube oil is raised to a dangerously high level	water causes oil to clog in journal bearings	emulsification occurs with resultant loss of lubricating qualities	oil additives break down into amino acids and polyglycerides when in contact with water	
13	1207	C	Engineering Control Centers for minimally attended machinery plants shall, in addition to the general alarm required by Coast Guard Regulations (46 CFR), be provided with a/an _____.	gyrocompass system alarm	satellite telecommunications alarm	personnel alarm	all of the above	
13	1208	B	Why are the condensate drains from the fuel oil heaters and fuel oil tank heating coils returned to the drain inspection tank?	To allow any oil to be separated from the steam.	To detect and prevent oil from getting in the boiler water.	As a safety precaution to prevent oil leaks from these coils.	As a safety precaution to prevent oil leaks into the bilges.	
13	1209	B	Engineering Control Centers for minimally attended machinery plants shall, in addition to the general alarm required by Coast Guard Regulations (46 CFR), be provided with a/an _____.	satellite telecommunications alarm	remote vital system alarm	gyrocompass system alarm	all of the above	
13	1210	D	In accordance with Coast Guard Regulations (46 CFR) for vessels propelled by steam turbines, the navigation bridge primary control system must include safety limit controls for _____.	high boiler water levels	low boiler water levels	low steam pressure	All of the above	
13	1211	A	Engineering Control Centers for minimally attended machinery plants shall, in addition to the general alarm required by Coast Guard Regulations (46 CFR), be provided with a/an _____.	engineer's assistance-needed alarm	gyrocompass system alarm	satellite telecommunications alarm	all of the above	

13	1212	B	In addition to being hazardous to personnel, gas leaks through the boiler casing can also _____.	cause overheating of the uptakes	impair the effectiveness of the air purge cycle	cause improper atomization of fuel oil	impair the operation of the high steam pressure limit switch	
13	1213	C	In what classification of turbines are the moving blades and the adjacent fixed rows of blades shaped to act as nozzles?	Impulse	Radial flow	Reaction	Helical flow	
13	1214	A	If the maximum steam generating capacity of a boiler is increased, Coast Guard Regulations (46 CFR) require that the safety valves' _____.	relieving capacity be checked	lifting pressure be increased	reseating pressure be increased	blowdown be reduced	
13	1215	D	A ship is equipped with the illustrated turbine gear set and a right hand turning propeller. When steam is admitted to the astern element, with sternway on, the high-speed gear on the high pressure side is_____.	rotating in the opposite direction as the low-speed pinion on the low pressure side as viewed from the aft end of the reduction gear.	turning clockwise as viewed from the forward end of the reduction gear.	turning opposite to the rotation of the high-speed gear on the low pressure side.	turning clockwise as viewed from the aft end of the reduction gear.	SE-0016
13	1216	B	A ship is equipped with the illustrated turbine gear set and a right hand turning propeller. When steam is admitted to the astern element, with sternway on, the high-speed pinion on the high pressure side is_____.	rotating in the same direction as the low-speed pinion on the low pressure side.	turning counter clockwise as viewed from the aft end of the reduction gear.	turning the same direction as the high speed gear on the low pressure side.	turning the opposite direction as the low speed reduction gear.	SE-0016
13	1217	D	Which condition could cause a low level in the deaerating feedwater tank (DC heater) as the vessel is increasing from maneuvering to sea speed?	Maintaining the water levels of both boilers excessively high	Excessive recirculation of main condensate	Insufficient flow of make-up feed to the condenser	All of the above	
13	1218	B	In a propulsion boiler, diesel oil is generally supplied to the burners when _____.	heavy smoking persists	lighting off a cold ship	a heavy fuel must be blended	it is necessary to compensate for overload capacity	
13	1221	D	Turbine blade erosion is accelerated by _____.	high blade speed	high moisture content	high vacuum	all of the above	
13	1222	B	In an oil fired water-tube boiler, inner casing air leaks can cause _____.	oxidation of the exposed furnace walls	chilling of the combustion gases	excessive feedwater consumption	localized overheating of tube surfaces	
13	1224	C	Which of the Coast Guard publications listed contain the information regarding allowable repairs to boilers installed on cargo vessels?	Rules and Regulations for Cargo and Miscellaneous Vessels	Manufacturer's Instruction Manual	Marine Engineering Regulations	Modern Marine Engineer's Manual	
13	1228	B	Many steam plants are designed so that diesel oil can be provided to the burners when _____.	heavy smoking persists	lighting off a cold ship	a heavy fuel must be blended	overload capacity is required	

13	1231	D	Which of the journal bearings listed most easily accommodates the minor turbine shaft misalignment?	Ball bearings	Roller bearings	Spring bearings	Spherically seated bearings	
13	1232	D	Foaming in a lube oil system can cause _____.	oil overflow	loss of cooler effectiveness	inadequate lubrication	all of the above	
13	1234	C	What is the policy regarding repairs to a cracked superheater header in a power boiler?	If the reverse side of the weld is inaccessible, complete penetration is unnecessary.	After excavation is completed, and prior to welding, the excavated area shall be examined by spot radiography.	No repairs by welding shall be made, except temporary emergency repairs, without prior approval of the Officer in Charge, Marine Inspection.	Post weld heat treatment of repaired cracks is only required if the pressure part is fabricated of alloy steel.	
13	1235	C	In order to test the lifting pressure of the deaerating feed heater relief valve, you would _____. I. close the auxiliary exhaust dump valves to the main and auxilary condenser II. increase the set point of the reduced steam pressure to the auxiliary steam system	I only	II only	Both I and II	Neither I nor II	
13	1237	A	After starting the main lube oil pump in a gravity-type lube oil system, you should verify that the gravity tanks are full by _____.	observing the overflow sight glass	sounding the gravity tanks	sounding the lube oil sump	observing the flow from the bearings	
13	1238	C	Boiler fuel oil atomizer parts should be cleaned by soaking in 'tip cleaner' or diesel fuel and _____.	polished with emery cloth	brushed with a steel brush	scraped with a nonabrasive tool	scraped with a modified table knife	
13	1240	C	In a double articulated reduction gear system, the component labeled "2" would be identified as the _____?	high speed pinion	low speed pinion	quill shaft	high speed gear	SE-0005
13	1241	A	Which of the following statements concerning the design of balanced throttle valves is correct?	They use a conventional valve disc and a balance piston.	They use two parallel seats and a balance cylinder.	The valve has a positive opening tendency at all times.	The piston is secured below the valve disc to prevent movement.	
13	1242	D	Air leaks through the inner or outer casing of a boiler could result in _____.	high superheater outlet temperature	low superheater outlet temperature	higher fuel consumption for normal steaming conditions	all of the above	
13	1243	D	In a double articulated reduction gear system, the component labeled "3" would be identified as the _____?	high speed pinion	low speed gear	quill shaft	high speed gear	SE-0005
13	1244	D	Your vessel has a fractured superheater header. In preparation for conducting the emergency repairs, where could one find information regarding the correct welding procedure and welder qualification to be used?	ASME Welding Qualifications Section IX	46 CFR Parts 50-63 Marine Engineering Regulations	ABS Rules	All of the above	

13	1245	B	In a double articulated reduction gear system, the component labeled "1" would be identified as the _____?	high speed pinion	low speed pinion	quill shaft	high speed gear	SE-0005
13	1246	B	Prior to relieving the watch you should first check the fireroom status by verifying the boiler water level and _____.	steam atomization pressure to the mechanical atomizers	fuel pressure to the burners	fuel oil viscosity	water drum level	
13	1247	A	When relieving the watch in the fireroom, you should first check the boiler water level and then _____.	check the fuel pressure to the burners	empty all oil drip pans	prepare to blow tubes	check port and starboard settling tank levels	
13	1248	B	To properly clean a burner tip, you should use _____.	light sand blast grit	a soft metal tool	a jack knife	a wire brush	
13	1249	D	Prior to relieving the watch you should first check the fireroom status by verifying the fuel oil pressure to the burners and _____.	DC heater temperature	prepare to blow tubes	check port and starboard settling tanks	boiler water level	
13	1250	C	When relieving the watch in the fireroom, you should first check the _____.	boiler water drum level	boiler steam drum temperature	fuel pressure to the burners	port and starboard settling tank levels	
13	1251	D	Which of the conditions listed would indicate water carryover to a turbine?	Loss of condenser vacuum.	High steam temperature in the high pressure turbine steam chest.	Decreased condensate salinity.	Noise and vibration in the turbine.	
13	1252	C	Desuperheated steam can be found at the _____.	main steam stop	generator steam stop	spray attemperator outlet	high pressure turbine steam chest	
13	1254	D	According to Coast Guard Regulations (46 CFR), the studs and bolts on marine boiler mountings must be removed for examination at least every _____.	3 years	4 years	5 years	10 years	
13	1261	B	An unusual vibration in the main propulsion turbine unit, accompanied by a rumbling sound in the reduction gear, could be caused by _____.	overloading of the condenser	a carryover from the boiler	a reduction in condenser vacuum	a labyrinth seal failure	
13	1262	B	Spray attemperators are commonly used to _____.	deaerate condensate	reduce steam temperatures	cool the intercondenser	aerate makeup distillate	
13	1264	D	During each two and one-half year inspection, which test or examination of a cargo vessel water tube boiler is required by Coast Guard Regulations (46 CFR)?	Accumulation test	Uptakes structural survey	Hydrostatic test	Fireside inspection	
13	1268	C	To properly remove the burner tip nut from the burner barrel, the barrel should be _____.	clamped in a machinist's vice on the work bench	fixed in the burner stowage rack	held by the fixture on the burner cleaning bench	removed from the gooseneck before removing the tip nut	
13	1271	B	The main propulsion turbine can be damaged by _____.	operating at slow speeds	water carryover from the boilers	maintaining vacuum too high	using the jacking gear when there is no vacuum	

13	1272	C	The primary purpose of a control desuperheater installed in the steam drum of a boiler is to _____.	assure a constant volume of steam flow through the entire superheater under all load conditions	regulate the temperature of superheated steam by adding moisture	regulate the superheater outlet temperature by cooling a portion of the superheated steam	regulate saturated steam temperature through the desuperheater	
13	1278	C	If oil is observed in the steam drains from a fuel oil heater, you should _____.	increase the fuel oil pressure to the heater	shift the drains to the atmospheric drain tank	transfer operation to another heater and secure the original heater	increase the steam pressure to that heater	
13	1281	A	Moisture erosion in the last stages of the low pressure turbine will result from _____.	low inlet steam temperature	excessive gland sealing steam	a leaking astern guardian valve	All of the above are correct.	
13	1282	D	The control desuperheater of most boilers functions to control _____.	superheated steam flow	desuperheated steam temperature	superheater inlet temperature	superheated steam temperature	
13	1288	B	A leaky fuel oil heater relief valve could be indicated by an increase in the _____.	sludge tank level	discharge piping temperature	contaminated drain tank level	fuel oil service pump pressure	
13	1291	B	Water entrained in the steam entering a turbine could result in _____.	excessive rotor shaft wear	blade erosion	turbine overspeed	fracturing of the carbon packing	
13	1292	C	One function of the desuperheater installed in a boiler steam drum is to _____.	raise the temperature of the steam in the dry pipe	distribute feedwater within the boiler	provide steam for auxiliary machinery	add moisture to superheated steam	
13	1294	B	The MAWP of a boiler is 900 psi and the normal drop across the superheater is 20 psi. If the superheater safety valve is set to lift at 825 psi, what are the minimum settings of the drum safety valves allowed by Coast Guard Regulations (46 CFR)?	825 psi	850 psi	875 psi	900 psi	
13	1295	A	Boyle's law can best be defined as _____.	the volume of an enclosed gas varies inversely with the applied pressure, provided the temperature remains constant	if the pressure is constant, the volume of an enclosed gas varies indirectly with absolute temperature	a body at rest tends to remain at rest.	none of the above.	
13	1296	D	Which of the following statements defines the term 'axial float' in reference to reduction gears?	The gears are not subject to excessive tooth loads due to mismatching of the journal bearing halves.	The gears are double-helical and axial thrust is eliminated.	The gears are capable of free motion, neither supporting nor being supported radially by other gears.	The pinion gears are capable of free axial motion	

13	1297	C	The term "divergent" is best described as _____.	approaching nearer together, as the inner walls of a tube that is constricted.	thermal and kinetic energy being converted to mechanical energy	moving away from each other, as the inner walls of a tube that flare outward	maintaining an equal distance between edges		
13	1298	C	What will occur if the fuel oil heater condensate returns are not opened or are partially plugged?	Fuel will become overheated.	Fuel consumption will decrease.	Fuel may not be heated sufficiently for proper combustion.	Fuel pump slippage will result.		
13	1299	A	Main reduction and pinion gears are double helically cut to _____.	balance axial thrust and reduce vibration	decrease reduction gear radial bearing loads	increase tooth deflection at high speeds	decrease the number of teeth in contact		
13	1301	C	A common cause of the babbitt linings cracking in a turbine journal bearing is _____.	prolonged operation at low speed	prolonged operation at full speed	vibration generated by the rotor	excessive thrust bearing wear		
13	1304	D	A boiler superheater safety valve is set to lift at 450 psi (3102 kPa). Coast Guard Regulations (46 CFR) require that if there is a pressure drop of 10 psi (69 kPa) across the superheater, the drum safety valve should set to lift at a pressure of _____.	450 psi (3102 kPa)	455 psi (3137 kPa)	460 psi (3171 kPa)	465 psi (3206 kPa)		
13	1308	B	If the fuel oil temperature flowing to the burners is too low, the _____.	fuel service pump will lose suction	boiler will produce heavy black smoke	boiler will produce dense white smoke	fuel service strainers will become clogged		
13	1311	D	If the main propulsion turbine begins to vibrate severely while you are increasing speed, you should _____.	open the throttle wider to pass through the critical speed	hold the turbine at that speed until vibration stops	stop the turbine and not answer any more bells	immediately slow the turbine to see if the vibration will stop		
13	1314	D	Coast Guard Regulations (46 CFR) require that alarm systems be provided for superheaters whose operating outlet temperature is capable of exceeding _____.	550°F (288°C)	650°F (343°C)	750°F (399°C)	850°F (454°C)		
13	1318	C	What causes carbon to adhere to the inside surfaces of a fuel oil heater?	Too much carbon in the fuel	Deteriorated zinc strips	Excessive fuel oil temperature	Vanadium in the fuel		
13	1321	A	Vibration in main propulsion turbines could be caused by _____.	uneven heating of the rotors	high pressure steam in the first-stage	high vacuum in the main condenser	thrust developed in the turbines		
13	1322	A	Desuperheated steam from the control desuperheater is returned to the main superheater to control the outlet temperature by the action of _____.	the superheater temperature control valve	the superheater flow valves	an orifice in the superheater inlet header	a diaphragm type pressure controller		
13	1328	B	Carbon deposits in a fuel oil heater are caused by _____.	low fuel oil temperature	high fuel oil temperature	low fuel oil viscosity	high fuel oil pressure		

13	1331	B	Which of the conditions listed is the most common source of torsional vibration in a geared turbine drive?	Gear excited critical vibrations	Propeller excited vibrations	Turbine rotor imbalance	Changing shaft thrust	
13	1332	A	The main function of a desuperheater is to _____.	maintain uniform steam flow through the superheater while providing auxiliary steam as required	heat the water in the drum while maintaining sufficient flow through the generating tubes	provide the boiler with additional steam generating surface while providing a sufficient reservoir for surface blow	heat the water in the drum while providing additional steam generating surface in the boiler	
13	1338	C	Carbonization of the conductive surfaces of a fuel oil heater results in reduced heating capacity because _____.	a fluid film layer covers the solid contaminants and increases heat transfer	the relative velocities of the fluids must be decreased causing a corresponding loss of heat transfer	the thermal conductivity of solidified contaminants is poor	radiational heat transfer becomes severely impaired	
13	1341	B	What should you do if you detect an abnormal vibration in the operating main propulsion turbine?	Notify the chief engineer and stand by the throttles.	Immediately slow the turbine until the vibration ceases.	Immediately stop the turbine.	Open the turbine drains until the vibration ceases.	
13	1342	A	One purpose of a desuperheater installed in a boiler steam drum is to _____.	protect the superheater from overheating	increase the boiler efficiency	add moisture to superheated steam	remove all superheat from generated steam	
13	1348	B	The overheating of fuel oil in the fuel oil heaters may result in _____.	excessive atomization	clogged fuel oil heaters	ineffective straining of the fuel oil	low fuel oil service pump discharge pressure	
13	1351	C	The slight wavy appearance of the tips of reduction gear teeth is a result of _____.	insufficient lube oil pressure	high lube oil temperatures	the method of manufacture and does not harm the gears	uneven bearing wear due to gross misalignment	
13	1352	C	A boiler fitting used to protect the superheater and to provide reduced temperature steam for use by auxiliaries is the _____.	reducing station	feedwater injector	desuperheater	dry pipe	
13	1358	A	If the fuel oil temperature in the fuel oil heater attains an excessive temperature, what will happen?	Carbon deposits will build up on the heating surfaces.	The fuel heater relief valve will open immediately.	The fuel oil pump will lose suction.	The fuel oil recirculating valve will automatically close.	
13	1361	D	A pressure drop occurs across both the moving and fixed blades of a reaction turbine as a result of the _____.	reversing blades causing a velocity drop with resultant pressure drop	conversion of the thermal energy to pressure energy always resulting in a pressure drop	interstage diaphragms creating a nozzle effect in the steam flow	moving and fixed blades being shaped to act as nozzles	

13	1362	D	Water-tube boilers having integral uncontrolled superheaters are equipped with internal desuperheaters to _____.	lower the temperature of bleed steam in a reheat type plant	add moisture to superheated steam	lower superheated steam pressure for use in auxiliary machinery	provide desuperheated steam for auxiliary machinery	
13	1368	B	An internal leak in a fuel oil heater can result in _____.	water contamination of the fuel oil	oil contamination of the heater drains	carbon buildup in the heater	fluctuating fuel oil pressure	
13	1371	B	The pressure drop existing across the diaphragm of a pressure compounded impulse turbine necessitates _____.	installation of a dummy piston and equalizing line to reduce thrust	installation of a packing seal to minimize interstage leakage	circumferential dovetailing to secure the rotor blades	Seal strippng the tips of the turbine blades	
13	1372	B	Under steady steaming conditions, the superheater outlet temperature is regulated by the _____.	integral superheater	control desuperheater	auxiliary desuperheater	radiant superheater	
13	1378	B	The contaminated steam system is secured for repairs. Live steam is supplied to the fuel oil heating system and its returns are directed to the drain tank. Considering these circumstances, an undetected leak in an idle fuel oil heater could eventually lead to _____.	secondary combustion	boiler tube failures	low stack gas temperatures	sputtering burners and possible loss of fires	
13	1381	A	The packing ring in an interstage diaphragm of a turbine is prevented from rotating by _____.	a horizontal joint key extending into a slot	spring tension exerted on retaining rings	steam pressure exerted on the packing segments	the weight of the diaphragm acting on the packing ring	
13	1382	B	Steam leaving the desuperheater is used to _____.	operate the ship service turbogenerator	operate auxiliary equipment	supply additional steam for propulsion during overload conditions	provide steam for propulsion during low speed operation	
13	1388	C	Condensate accumulation in the steam side of a fuel oil heater could result in _____.	scale accumulation in an operating heater	water contamination of the fuel oil	reduced heating capacity in an operating heater	annealing of the heater tube bundles	
13	1390	D	While making your rounds, you notice the main lube oil temperature to be higher than normal. To remedy this situation, you should _____.	speed up the main lube oil pump	open the lube oil cooler seawater inlet valve wider	throttle in on the lube oil cooler seawater discharge valve	increase the opening of the lube oil cooler seawater discharge valve	
13	1391	B	Shrouding, with regards to steam turbines, is rolled to the curvature of the blade ends and fitted to the blade _____.	roots	tenons	seal strips	dovetails	
13	1392	B	Overheating of the generating tubes will occur when a boiler reaches its end point of _____.	evaporation	circulation	combustion	moisture carryover	
13	1398	C	Condensate accumulating in the steam side of a fuel oil heater could result in _____.	overheating	scale accumulation	corrosion	immediate oil contamination of the condensate	

13	1401	D	Which turbine blade is best suited for high pressure installations?	Pot-brazed oval shrouded type	Gaged type	Wire-lashed type	Shrouded segmental type	
13	1402	A	Which 'end point' will result in the most severe damage to the boiler?	Circulation	Carryover	Combustion	Atomization	
13	1408	D	The rate of fouling on the oil side of fuel oil heaters is directly related to the _____.	quality of the steam flow through the heater	shape of the heating coils in the heater	pressure on the oil in the heater	rate of oil flow through the heater	
13	1411	C	Which of the following statements is true concerning the turbine shown in the illustration?	The low pressure turbine is a reaction unit.	The astern element is of the Curtis type consisting of one three-row stage and one two-row stage.	A steam deflector is provided between the astern element and the ahead stages of the LP turbine.	The turbines can be classified as single flow, direct compound, or cross-connected.	SE-0016
13	1412	A	Which of the following statements about boilers is correct?	A hot boiler will continue to generate steam after the fires are secured.	No boiler will continue to generate steam after the fires are secured.	The water level in a properly operated boiler will not shrink or swell.	Loss of water will not harm a boiler if the water level can be restored.	
13	1418	B	The rate of fouling on the oil side of a fuel oil heater is inversely related to the _____.	quality of steam flowing through the heater	flow rate of fuel oil through the heater	shape of the heating coils in the heater	pressure on the oil in the heater	
13	1421	C	During maneuvering, a vessel has just reached full ahead from a dead slow condition. Which of the following actions reflects the first operation of the gland seal regulator shown in the illustration?	Pilot valve bushing would move downward.	Valve "D" would move upward.	Bellows and connecting link would move upward.	Needle valve would automatically become seated.	SE-0004
13	1422	A	When increasing the firing rate of a boiler, which of the following should be carried out FIRST?	Increasing of the forced draft air pressure.	Increasing the fuel pressure.	Increasing the feedwater flow.	Decreasing the steam pressure.	
13	1424	C	Which of the items listed is required by Coast Guard Regulations (46 CFR) to be stamped on a pressure vessel?	Hydrostatic test pressure	Pneumatic test pressure	Coast Guard Symbol	Minimum wall thickness	
13	1428	D	Which of the conditions listed would indicate a dirty fuel oil strainer?	Decreasing fuel oil temperature	Dirt and sediment deposits in the atomizers	Decreasing pressure drop across the strainer	Decreasing fuel oil pressure at the burner manifold	
13	1431	D	Guardian valves are installed on main propulsion turbines to _____.	prevent steam from leaking into the astern element while the vessel is maneuvering	provide an emergency means of quick throttle closing	provide a means to supply steam directly to the astern element of the turbine	prevent steam from leaking into the astern element at full sea speed	
13	1432	A	To safely increase the firing rate of a boiler, you should always increase the forced draft pressure _____.	before increasing the fuel pressure	after increasing the fuel pressure	by opening the burner register wider	by opening additional burner registers	
13	1438	B	If one fuel oil strainer of a duplex unit becomes clogged while the vessel is steaming at sea, the FIRST action should be to _____.	clean the dirty strainer as quickly as possible	change the oil flow over to the clean side	stop the fuel oil service pump	open the strainer bypass valve	

13	1441	C	In the turbine and gear set shown in the illustration, when going astern, the minimum tolerable clearance between the rotor and intermediate or guide blading is _____.	.025 inch	.085 inch	.090 inch	.150 inch	SE-0016
13	1442	B	To safely decrease the boiler firing rate, you should always reduce the fuel pressure _____.	after reducing the forced draft pressure	before reducing the forced draft pressure	by opening the oil recirculating valve	by opening the fuel pump relief valve	
13	1444	C	Which of the following statements is true concerning safety and relief valve escape piping?	Expansion joints or flexible pipe connections are prohibited.	The piping shall be led as near vertical as possible to the atmospheric drain tank.	The piping should be supported and installed so that no stress is transmitted to the valve body.	All of the above.	
13	1448	C	If you noted a large difference in the pressures indicated by a duplex pressure gage to the fuel oil system strainer, you should _____.	increase the fuel pump discharge pressure	reduce the firing rate of the boilers	shift to a clean fuel oil strainer	secure the fuel oil service pump	
13	1454	D	In accordance with Coast Guard Regulations (46 CFR), all vessels having oil fired main propulsion boiler(s) must be equipped with _____.	at least two fuel service pumps	at least two fuel oil heaters	a suction and discharge duplex strainer	all of the above	
13	1458	D	If a fuel oil solenoid valve fails to secure the fuel oil supply to the starboard boiler upon loss of the forced draft air supply, you should immediately _____.	open the crossover damper manually from the port forced draft fan	reset the starboard forced draft fan circuit breaker on the main switchboard	stop the fuel oil service pump	manually close the quick-closing valve in the fuel oil line to the starboard boiler	
13	1461	C	While maneuvering out of port, you answer a stop bell. You notice a lot of steam coming out of the gland exhaust condenser vent, in addition to the main condenser hotwell level being low. For this condition you should _____.	decrease gland sealing steam pressure	speed up the condensate pump	manually recirculate condensate and add some makeup feed	increase steam pressure to the air ejectors	
13	1464	B	Coast Guard Regulations (46 CFR) require that quick-closing valves on a fuel oil service system should be installed as close as is practicable to the _____.	suction side of the fuel oil pump	boiler front header	fuel oil settling tanks	fuel oil service heaters	
13	1471	B	When securing a main propulsion turbine equipped with carbon packing glands, the vacuum should always be broken before securing gland seal steam because _____.	turbine rotor well will expand faster than the casing	cold air drawn across the carbon packing will damage it	jacking gear will be unable to be engaged	gland seal leak off lines will fill with water	
13	1472	C	When raising steam on a cold boiler under normal conditions, you should always _____.	raise steam within one hour or less	take 24 hours to raise steam	use a small orifice burner sprayer plate to start	use a large orifice burner sprayer plate to start	
13	1481	D	With vacuum up and the main propulsion turbine standing by while awaiting engine orders, it is necessary to roll the unit alternately ahead and astern every five minutes to _____.	distribute the gland sealing steam evenly throughout the glands	slowly bring the lube oil and bearings to operating temperature	warm the astern guarding valve and the low lube oil pressure throttle trip	reduce the possibility of warping the turbine rotors	

13	1482	A	The time taken to raise steam on a cold boiler should always be _____.	the time specified by the boiler manufacturer	not less than a full 24 hour	not more than 1 full hour	as short as possible to avoid over expansion	
13	1484	B	Coast Guard Regulations (46 CFR) require that the design pressure of an economizer integral with the boiler and connected to the boiler drum without intervening stop valves shall be at least equal to _____.	the feed pump shut off head pressure	110% of the drum safety valves highest set pressure	125% of the boiler hydrostatic test pressure	150% of the boiler design test pressure	
13	1488	A	If the boiler fires are extinguished by water entrained in the fuel oil, you should FIRST _____.	secure the burner valves	secure the settler tank suctions	reduce the load on the boiler	purge the boiler furnace	
13	1489	D	Any abnormal condition or emergency that occurs in the engine room must be reported immediately to the _____.	first assistant engineer	fireman on watch	Chief engineer	engineer on watch	
13	1491	D	When a reference input signal from the bridge to the engine room takes place, the signal is inverted in the amplifiers and function generators. A negative signal from the amplifier, shown in the illustration, labeled "M", will result in a _____.	positive signal to the ahead hydraulic actuator pilot motor	negative signal to the ahead hydraulic actuator pilot motor	positive signal to the astern hydraulic actuator pilot motor	negative signal to the astern hydraulic actuator pilot motor	SE-0002
13	1492	C	After the steam pressure has risen to about 5 pounds more than the pressure of the boilers already on the line, you can _____.	close the air cock	close the superheater vent	put the boiler on the line	increase the boiler firing rate	
13	1494	B	When a boiler economizer is fitted with a valved bypass, Coast Guard Regulations (46 CFR) require which of the following devices to be installed?	A sentinel valve is to be fitted to a by-passed economizer.	A stopcheck valve is to be located at the economizer outlet.	A check valve is to be located at the economizer inlet.	An emergency drain line must be provided to the reserve feed tank.	
13	1498	B	Water in the fuel supply to a steaming boiler can be detected by _____.	observation of the fuel oil heater drains	sputtering of the fires	panting of the casing	dense white smoke being observed in the periscope	
13	1501	B	How many pinion gears are required in an articulated, double reduction gear set for a cross-compounded turbine?	Two	Four	Six	Eight	
13	1508	D	Water emulsified in the fuel oil when supplied to a boiler is indicated by _____.	sputtering of the fires	lower than normal fuel oil pressure	excessive white smoke	all of the above	
13	1511	C	Coast Guard Regulations (46 CFR) concerning lubricating oil systems for main propulsion turbines, require _____.	the lube oil system to function satisfactorily when the vessel has a permanent list of 25°	lube oil coolers to have three separate means of circulating water	lube oil piping to be independent of other piping systems	two standby auxiliary lube oil pumps be provided	
13	1512	A	In a regenerative air heater, air is bypassed around the heater while _____.	operating at low steaming rates	blowing tubes	crossing over forced draft fans	giving a surface blow	

13	1518	D	If the fires in a boiler furnace begin sputtering or hissing, you should suspect _____.	excessive fuel pressure at the burners	loss of fuel pump suction	low fuel oil temperature	water contamination of the fuel oil	
13	1521	D	Which of the following statements represents the reason why the babbitt of a turbine journal bearing is relieved at the point of oil entry along the horizontal joint?	To prevent oil from backing up in the supply line.	To permit oil to discharge through the rear of the bearing.	To prevent hydraulic pressure buildup when the journal rotates.	To permit the rotor journal to draw oil around the shaft.	
13	1522	C	Stack type air heaters are bypassed when a vessel is in port in order to prevent _____.	insufficient air supply to the fires due to the pressure drop across the heater	interference with the operation of the soot blowers	corrosion of the heater due to the low stack temperatures	localized heat stressing of air heater surfaces	
13	1524	C	Coast Guard Regulations (46 CFR) concerning superheater safety valves require that the valve be _____.	set at a pressure higher than the drum safety valves	operated by a pilot valve	set at a pressure not exceeding the design pressure of the superheater outlet flange	set at the design pressure of the turbogenerator steam chest	
13	1528	C	When boiler fires begin sputtering, indicating water in the fuel oil settling tank, you should _____.	start the alternate fuel oil service pump	shift to the service pump low suction	change suction to the alternate settling tank	reduce the fuel pump operating speed	
13	1529	A	The following information was recorded after a recent L.P. turbine bearing installation. The bearing temperature was logged at the indicated time intervals as:1200-110°F(43°C)1210-123°F(51°C)1220-136°F(58°C)1230-149°F(65°C)1240-153°F(67°C)1250-155°F(68°C)1300-155°F(68°C)The shaft RPM and lube oil cooler outlet temperature remained constant. The readings indicate _____.	normal temperature during wear in	water in the lube oil system	wiping of the bearing material	excessive bearing preload conditions	
13	1531	B	In an emergency, an auxiliary turbine can be stopped by _____.	closing the exhaust valve slightly	actuating the throttle hand tripping device	rotating the hand lube oil pump backwards	increasing the load on the driven unit	
13	1532	A	One function of the air and flue gas bypass dampers installed in regenerative type air heaters is to _____.	avoid excessive cooling of the stack gases during low load operation	regulate combustion air temperature at normal firing rates	reduce the load on the element drive motor	reduce the temperature of the double undulated heating elements	
13	1534	C	The safety valve nominal size for propulsion boilers and superheaters must be not less than 1 1/2 inches and not more than 4 inches. The term 'nominal size' refers to the _____.	free spring length	diameter of the feather	diameter of the inlet opening	diameter of the huddling chamber	

13	1537	C	Which of the following statements is NOT one of Newton's laws?	A body at rest tends to remain rest and a body in motion tends to remain in motion.	For every action there is an equal and opposite reaction.	If the pressure is constant, the volume of an enclosed dry gas varies directly with the absolute temperature.	An imbalance of force on a body tends to produce an acceleration in the direction of that force which is directly proportional to the applied force and inversely proportional to the mass of the body.	
13	1538	C	When the fires begin to sputter, you should _____.	decrease the manifold pressure	increase the manifold pressure	take suction from another settling tank	switch the duplex strainer elements	
13	1539	B	A theoretical engine cycle is a process that _____.	takes place in the combustor of the engine	begins with certain conditions, progresses through a series of additional conditions and returns to the original conditions	begins with certain conditions, progresses to a steady state and stays there	None of the above.	
13	1540	A	Boyle's law can best be defined as _____.	The volume of an enclosed gas varies inversely with the applied pressure, provided the temperature remains constant	If the pressure is constant, the volume of an enclosed gas varies directly with absolute temperature	A body at rest tends to remain at rest.	None of the above.	
13	1542	C	A regenerative type air heater should be bypassed at low load in order to _____.	prevent chipping of the ceramic coating	prevent condensation in the steam baffling	avoid excessive cooling and condensation of the exhaust gases	maintain a positive seal on the replaceable basket	
13	1544	D	Coast Guard Regulations (46 CFR) for boiler safety valves, require that _____.	no valves of any type shall be installed in the leak off from drains or drain headers	all safety valve gags or clamps must be carried on board the vessel at all times	the final setting of the safety valves shall be checked and adjusted under steam pressure	All of the above are correct.	
13	1548	C	If the fires in both boilers start to sputter, you should immediately _____.	shift feed suction to the double bottom	speed up the fuel oil pump	shift settlers	shift to the low suction	
13	1551	A	Rotating flyweights acting against a spring force makes up a simple type of _____.	governor	reducing valve	safety valve	feedwater regulator	

13	1552	D	Air for combustion is bypassed around the boiler air heater when the _____.	soot blowers are operating	control desuperheater is operating	combustion control system is in manual	boiler is steaming at low rates	
13	1558	D	If the fires start sputtering while steaming under steady conditions, which of the actions listed should be taken?	Start the standby fuel oil service pump.	Increase the fuel oil pressure.	Shift over to another fuel strainer.	Shift suction to another settling tank.	
13	1561	C	The main throttle valve on a turbine admits steam directly into the _____.	nozzle diaphragm	turbine blades	steam chest	crossover connection	
13	1562	B	When a vessel is in port, stack type air heaters are bypassed in order to prevent _____.	insufficient air supply to the fires due to the pressure drop across the heater	corrosion of the heater due to low stack temperatures	excessive back pressure in the furnace due to low flow rates	localized heat stressing of air heater surfaces	
13	1564	C	According to Coast Guard Regulations (46 CFR), which of the following is classified as a boiler mounting?	Main feed check valve	Soot blower element	Blowoff valve	Escape piping drain valve	
13	1566	B	A steam vessel is operating at sea and despite troubleshooting the system by all the vessel's engineers, the transfer of fuel to the settler has not been possible and the settler will be empty in a few minutes. As the watch engineer, your NEXT step should be to _____.	activate the "engineer needs assistance" alarm	line up the diesel cold start system	warm up the emergency generator	repeat all the steps that have been taken to determine the cause of the problem	
13	1567	B	The downcomer tubes installed in modern watertube boilers would normally be located _____.	outside of the boiler double casing	between the inner and outer boiler casings	inside of the boiler inner casing	in the furnace gas passages	
13	1568	C	Oil in the contaminated drain inspection tank results from _____.	a defective relief valve on the fuel oil heater	improper drainage of the fuel oil heater coils	a leaking heating coil in a fuel oil settling tank	operating the fuel oil heater at excessive temperatures	
13	1571	C	If a turbine bearing high temperature alarm sounds, you should immediately _____.	increase lubricating oil flow	increase cooling water flow	slow the turbine	stop the turbine	
13	1572	B	Accumulation tests are conducted in order to determine the _____.	steam generating capacity of an individual boiler	steam relieving capacity of safety valves	maximum combined oil consumption of all oil burners installed on a single boiler	maximum combined steam generating capacity for all propulsion boilers of a single plant	
13	1574	C	In accordance with Coast Guard Regulations (46 CFR) all fuel oil service piping in the vicinity of the burners must _____.	utilize leak proof gaskets in all joints	have all joints seal welded	have wrap around deflectors on all bolted flanged joints	be provided with coamings or drip pans	
13	1577	B	Steam drains from the potable water system hot water heater would be collected in the _____.	deaerating feedwater heater	contaminated drain inspection tank	gland exhaust condenser	first stage heater	

13	1578	C	Which of the listed conditions would indicate a dirty atomizer sprayer plate?	Fluctuating pressure in the windbox.	Carbon deposits on the register doors.	Dark streaks in the burner flame.	Dazzling white incandescent burner flame.	
13	1581	D	In a steam turbine and reduction gear main propulsion plant, the sending unit for the low oil pressure signal is usually installed _____.	at a point on the inlet side of the main bearings as close to the bearings as possible	at a point on the outlet side of the main bearings as close to the bearings as possible	at the point of highest pressure in the supply line to the bearings	at the end of the supply line header to the bearings	
13	1584	D	Coast Guard Regulations (46 CFR) concerning marine boilers, require the installation of a safety valve on the _____.	auxiliary steam outlet	desuperheated steam outlet	preheated steam outlet	superheated steam outlet	
13	1591	C	Where three gear trains, i.e. high pressure first reduction, low pressure first reduction, and second reduction are each contained in a separate and sequential portion of the gear housing, the reduction gear unit is known as _____.	nested	locked train	articulated	none of the above	
13	1592	A	Before blowing tubes in a boiler equipped with steam soot blowers, you should _____.	increase the boiler water level	decrease the boiler water level	reduce the forced draft fan speed	lower the boiler steam pressure	
13	1598	A	If the fuel oil service piping was leaking upstream of the quick-closing valve, you should be able to stop the leak by closing the _____.	master oil valve	root valve	burner valve	recirculating valve	
13	1599	D	An overheated bearing in the main propulsion unit is indicated by _____.	bubbles in the sight flow glasses	sludge in the lube oil strainers	high level in the lube oil sump	high temperature of the lube oil leaving the bearing	
13	1601	C	Rotating flyweights, acting against a spring force, will provide a simple type of _____.	feedwater regulator	safety valve	governor	reducing valve	
13	1602	A	Before using the steam soot blowers to blow tubes at sea, you should _____.	raise the water level	lower the water level	increase the firing rate	decrease the firing rate	
13	1604	D	In accordance with Coast Guard Regulations (46 CFR), which of the following materials may be used in short lengths between the fuel oil boiler front header manifold and the atomizer head to provide flexibility?	Copper tubing	Annealed copper nickel	Nickel copper	All of the above	
13	1608	C	Which of the conditions listed can cause the flame of a mechanically atomized burner to be blown away from the burner tip when you are attempting to light off?	Insufficient excess air is being supplied to the furnace.	Fuel oil viscosity is too low.	The diffuser is burned out.	The secondary air cone is improperly adjusted.	
13	1609	D	Hot running bearings can be caused by _____.	inadequate lube oil supply	contaminated lube oil	excessive loading	all of the above	
13	1611	A	A constant speed hydraulic governor would more than likely be installed on a _____.	turbogenerator	main propulsion turbine	main feed pump	main condensate pump	
13	1612	C	In preparing to blow tubes at sea, you should _____.	increase the firing rate	decrease the firing rate	increase the forced draft speed	decrease the forced draft speed	

13	1619	A	Poor atomization accompanied by an elongated flame from a steam atomization burner is MOST likely caused by _____.	the fuel oil temperature being too low	improper operation of traps in atomizing steam return piping	the forced draft fan too slow for the boiler load	an improper cetane number	
13	1621	B	An excess pressure governor should be used on a _____.	main circulator pump	turbine-driven feed pump	low pressure propulsion turbine	forced draft fan	
13	1622	B	Boiler forced draft pressure should be increased before blowing tubes to _____.	prevent condensation in the uptakes	aid in removing loosened soot	maintain a clear stack	prevent a drop in steam pressure	
13	1624	A	According to Coast Guard Regulations (46 CFR), which of the following is permitted in boiler fuel oil service system discharge piping?	Screwed bonnet valves of the union bonnet type.	Pipe unions one inch or greater in diameter.	Bushings made of seamless steel.	Street ells made of carbon steel.	
13	1634	C	Coast Guard Regulations (46 CFR) for boiler fuel oil service systems require _____.	fuel oil heaters for boilers burning fuels with low viscosity	fuel oil service tanks to overhang boilers to utilize heat radiated from the boilers for greater efficiency	machinery driving fuel oil service pumps to be fitted with remote controls so that they may be stopped in the event of a fire	all piping between service pumps and burner fronts to be located below the floor plates to eliminate fire hazards	
13	1638	A	Fluctuations in the atomizing steam pressure at the burners could be caused by a/an _____.	malfunctioning steam trap in the atomizing steam system	incorrectly assembled air register	partially closed atomizing fuel valve	partially opened recirculating valve	
13	1641	D	The constant pressure governor of a turbine-driven feed pump maintains which of the following pressures at a constant value for all capacities?	Turbine inlet	Turbine exhaust	Pump suction	Pump discharge	
13	1642	B	After routine blowing of tubes at sea, there should be a decrease in the _____.	fuel oil temperature	stack temperature	excess air required for complete combustion	CO2 in the stack gas	
13	1647	D	A triple element, main propulsion, boiler feedwater regulating system commonly used aboard ship utilizes _____.	two-position differential gap action	proportional action	proportional plus reset action	proportional plus reset plus rate action	
13	1648	A	When slight sputtering is detected at the boiler atomizer, you should _____.	check for water in the fuel supply	increase furnace air supply	shut off the oil supply and purge the furnace	close burner register shutters and increase fuel oil service pump speed	
13	1651	D	Guardian valves are installed on main propulsion turbines to _____.	prevent steam from leaking into the astern element while the vessel is maneuvering	provide an emergency means of quickly closing the throttle	provide a means to supply steam directly to the astern element of the turbine	prevent steam from leaking into the astern element while at full sea speed	

13	1652	D	Which of the listed operational precautions is necessary before blowing tubes?	Increase forced draft fan speed.	Open all drains in soot blower steam supply piping.	Thoroughly warm all soot blower steam supply piping.	All of the above.	
13	1657	C	A pneumatic dual element, main propulsion, boiler feedwater regulating system commonly used aboard ship utilizes _____.	two-position differential action	proportional action	proportional plus reset action	on off reset action	
13	1661	A	In any governor there is a small range of speed in which no corrective action occurs. This speed range is called the governor dead band and is caused by _____.	friction in the governor linkage and control valve	excessive sensitivity in the governor control valve	speed droop designed into the governor system	hydraulic slippage in the governor servomotor system	
13	1662	D	Scavenging air is supplied to steam soot blower elements to _____.	provide cooling air when soot blower elements are rotating through blowing arcs	prevent buildup of soot on the element	prevent overheating of adjacent tubing	prevent the backup of combustion gases into soot blower heads	
13	1667	B	A single element boiler feedwater regulating system used aboard ship utilizes _____.	two position differential gap action	proportional action	proportional plus reset action	proportional plus reset plus rate action	
13	1671	C	Lube oil coolers are necessary in most engine lubricating systems because _____.	engine oil is used continuously and cooling prevents the oil from wearing out	harmful acids will be condensed and then removed by the centrifuge	cooling increases viscosity and aids in maintaining the oil film strength	cooling decreases viscosity and improves engine thermal efficiency	
13	1672	D	The arc through which a steam soot blower element blows is regulated by the _____.	control air pressure	direction of element rotation	steam supply pressure	cam profile	
13	1673	C	Downcomers are installed between the boiler inner and outer casing to _____. I. increase circulation rates II. decrease the amount of heat that they can absorb from the furnace	I only	II only	Both I and II	Neither I or II	
13	1674	B	Downcomers are installed between the inner and outer boiler casings to _____. I. increase the end point of combustion II. increase the end point of circulation	I only	II only	Both I and II	Niether I or II	
13	1675	D	Downcomers are installed between the inner and outer boiler casings to _____. I. increase the end point of carry over II. decrease the end point of circulation	I only	II only	Both I and II	Niether I or II	
13	1676	D	Downcomers are installed between the inner and outer boiler casings to _____. I. increase the end point of combustion II. increase the end point of carry over	I only	II only	Both I and II	Niether I or II	
13	1677	A	As steam first enters the main propulsion turbine, which of the following energy conversions takes place?	potential to kinetic	mechanical to thermal	electrical to thermal	thermal to electrical	

13	1678	B	In a multi-burner firebox, a burner tip with a scratched or enlarged orifice will _____.	have no effect on the flow of oil if the proper pressure is maintained	result in an uneven flow of oil through the burner	cause a high fuel oil return line back pressure	cause smokeless and flameless combustion	
13	1680	A	When on watch in the engine room, a main turbine bearing high temperature alarm is indicated and remotely displayed as 145 degrees Fahrenheit, you should _____.	assume, but verify that the circuit has malfunctioned	notify the bridge that you will be slowing down the main turbine	change over to the standby main lube oil supply pump	increase the speed of the operating main lube oil supply pump	
13	1681	A	Which of the following types of bearings are used for the reduction gears in a marine steam turbine installation?	Babbitt lined split shell	Lignum vitae lined precision	Bronze lined cutless	Sintered bronze bushings	
13	1682	C	The primary purpose of the boiler internal dry pipe is to _____.	prevent priming and foaming in the boiler drum	remove all moisture from steam leaving the boiler	permit a flow of nearly dry saturated steam	prevent foreign materials from entering the steam drum	
13	1688	C	Excessive accumulation of carbon deposits on a boiler burner throat ring and diffuser could result in _____.	too much excess combustion air	a reduced boiler fuel oil pressure	a decrease in boiler efficiency	increased heat transfer and overheating	
13	1691	D	To accurately measure the amount of wear on a high speed pinion journal bearing with a bridge gage, you must _____.	be sure that the area of greatest wear is at 90° to the measuring pin	shift the journal to position the pinion off center in the bearing	raise the journal to a height equal to the oil clearance	roll the bearing shell until the wearing zone is at the bottom	
13	1692	B	Which of the following statements represents one operational characteristic of a cyclone steam separator?	Unit reduces the circulation of the steam and water mixture in the boiler.	Unit imparts a rotational motion to the steam and water mixture.	Steam is forced to the outer side of the separator by centrifugal force.	Water is forced upward by centrifugal force.	
13	1694	C	According to Coast Guard Regulations (46 CFR), feedwater nozzles shall be fitted with sleeves, or have other suitable means employed to reduce the effects of temperature differentials on all boilers designed for operating pressures of _____.	250 psig (1825 kPa) or over	300 psig (2169 kPa) or over	400 psig (2859 kPa) or over	600 psig (4238 kPa) or over	
13	1696	A	For a gravity type lube oil system, a remote pressure sensing device is installed on the main unit lube oil header to enable the watch engineer to _____. I. determine if there is sufficient lube oil pressure to the main engine II. be certain that the bearings are being adequately lubricated	I only	II only	Both I and II	Neither I nor II	
13	1698	C	Carbon deposits on the boiler burner throat ring is usually caused by _____.	too much excess combustion air	a faulty ignition electrode	a dirty atomizer sprayer plate	the burner cycling on and off	

13	1700	D	Bi-color remote water level indicators, operate on the principle of _____.	different refractive properties of steam and water	increased feed rates at higher steam demand	different chemical properties of steam and water	different pressures which result from the comparison of the varying water level in the drum with that of a constant head	
13	1701	A	As steam first enters the main propulsion turbine, which of the following energy conversions takes place?	thermal to mechanical	mechanical to thermal	electrical to thermal	thermal to electrical	
13	1702	C	Circulation of boiler water to the water wall tubes is maintained by the _____.	water screen tubes	risers	downcomers	generating tubes	
13	1703	A	Which of the following statements is true regarding lube oil coolers used for main steam propulsion systems?	Regulating the inlet water flow to a lube oil cooler may result in air binding of the water side.	A lube oil cooler is typically constructed as a cross-flow type heat exchanger.	The coolers may be bypassed when operating in warm sea water temperatures.	The lube oil usually flows thru the tubes and the cooling water around the tubes.	
13	1704	D	Coast Guard Regulations (46 CFR) state that main propulsion water-tube boilers are not required to be fitted with a surface blow off valve if the design pressure is _____.	more than 200 psig (1436 kPa)	more than 250 psig (1795 kPa)	more than 300 psig (2169 kPa)	more than 350 psig (2513 kPa)	
13	1706	A	Which of the following statements represents the advantage of using a small diameter boiler tube over a larger diameter tube?	Small diameter tubes have a greater ratio of generating surface area to the volume of contained water	Small diameter tubes reduce the heating surface area.	Small diameter tubes are less affected by the insulating properties of soot.	Small diameter tubes provide for greater heat transfer rates.	
13	1707	A	What is the main constituent in fuel oil which determines its heat value?	Hydrocarbons	Oxygen	Nitrogen	Sulphur	
13	1708	C	Failure of the fuel oil service pump to maintain fuel oil flow to the burner could be caused by _____.	a high relief valve setting	excessive return line oil pressure	dirty fuel oil strainers	excessive fuel pump speed	
13	1710	A	Air accumulated in the intercondenser of the air ejector assembly is discharged directly to the _____.	aftercondenser	high pressure turbine	main condenser	atmosphere	
13	1711	D	Precautions to be observed prior to starting a turbine driven cargo pump, should include _____.	assuring that the turbine casing drains are wired closed	observing the operation of the overspeed trip	open all governor oil relay drains	checking the hand tripping device for proper operation	
13	1712	C	When preparing to cut a boiler in on the line, you determine that the steam pressure of the incoming boiler is about 5 psig above line pressure. Which of the following steps should you take next?	Open the superheater vent.	Light off additional burners.	Open the main steam stop.	Test the hand relieving gear.	

13	1713	D	Leakage over the ends of the blade tips, as a result of the pressure differential between each row of blades in a reaction turbine, can be reduced by _____.	thin tipping	end-tightening	seal stripping	All of the above are correct.	
13	1714	C	An energy loss associated with a reaction turbine, but not an impulse turbine, is _____.	throttling loss	windage loss	tip leakage loss	leaving loss	
13	1715	C	An increase in clearance between reaction blade tips and the turbine casing will result in _____.	an increase in rotor thrust load	an increased pressure drop across the blades	steam leakage over the blade tips	increased blade erosion	
13	1716	D	Thin tipping is a type of turbine blade design primarily used to _____.	increase the effective blade surface area without increasing blade weight	prevent any pressure drop from occurring through the moving blades	provide a means for mounting the shrouding on the blade tips	reduce losses through blade tip leakage	
13	1717	C	What is used to compensate for the increased possibility of blade vibration ocurring with impulse turbine blading?	The decreased pressure drop across the blade due to the thin tip design.	Tuned vibration dampers.	Securing the blade tips with shrouding.	Seal stripping the groove within the turbine casing.	
13	1718	C	Failure of the fuel oil service pump to maintain fuel oil flow to the burners of the boiler could result from _____.	incorrect burner linkage adjustment	carbon deposits on the ignition electrode	leaks in the pump suction line	excessive fuel return pressure	
13	1719	D	According to the data given in illustration SG-0026, which of the following would be the physical state of the fluid at a gage vacuum of 25.03 inches Hg, and 138.79 degrees Fahrenheit.	Subcooled liquid	Saturated liquid	Mixture of saturated liquid and vapor	Superheated vapor	SG-0026
13	1722	C	Which of the listed tubes provides circulation to the water wall tubes?	Water screen tubes	Risers	Downcomers	Generating tubes	
13	1723	A	According to the data given in illustration SG-0026, which of the following would be the physical state of the fluid at a gage vacuum of 25.03 inches Hg, and 126.08 degrees Fahrenheit.	Subcooled liquid	Saturated liquid	Mixture of saturated liquid and vapor	Superheated vapor	SG-0026
13	1728	B	If oil is found in the fuel oil heating drain system when using live steam directly to the heating coils, which of the actions listed should be taken?	Secure the boiler.	Shift contaminated drains to proper holding area.	Bottom blow the boiler.	Shift to low fuel oil suction.	
13	1729	A	Which of the following reaction turbine components listed converts thermal energy into kinetic energy.	Fixed and moving blades	Fixed blades only	Moving blades only	None of the above	

13	1730	D	A steam plant is operating at 100% power when the atmospheric drain tank runs dry allowing a large air leakage into the main condenser. Which of the following will occur as a result of this air leakage?	Decreased condensate temperature	Decreased pressure in the main condenser	Decreased suction pressure at the condensate pump	Decreased condenser cooling water outlet temperature	
13	1732	C	Why does air entry into the main condenser reduce the efficiency of the steam cycle?	Steam flow rate through the main turbine increases	Condensate subcooling in the main condenser increases	Low pressure turbine exhaust steam enthalpy value increases	The air mixes with the steam and enters the condensate	
13	1733	A	What affect will the emergency plugging of leaking condenser tubes have on the condenser pressure and hotwell temperature when returning to normal steam plant sea speed operation?	Absolute pressure and hotwell temperature will increase	Absolute pressure will decrease and hotwell temperature will increase	Absolute pressure will increase and hotwell temperature will decrease	Absolute pressure and hotwell temperature will decrease	
13	1734	A	Which of the following statements represents the advantage of using a small diameter boiler tube over a larger diameter tube?	Small diameter tubes result in lower outside tube metal temperatures.	Small diameter tubes reduce the heating surface area.	Small diameter tubes are less affected by the insulating properties of soot.	Small diameter tubes provide for greater heat transfer rates.	
13	1736	B	Your main propulsion boilers are equipped with a two element feedwater regulating control system. While on watch, you are required to respond to a 'slow' bell from full sea speed. Under these conditions the automatic feedwater regulator will have _____.	opened the feedwater valve wide due to the effect of shrink	closed down on the feedwater valve due to the decrease in steam flow demand	partially closed down on the feedwater valve due to the effect of swell	fully opened the feedwater valve due to the increase in steam flow	
13	1737	D	The net positive suction head of a boiler centrifugal feed pump should be calculated to include the feedwater vapor pressure and the _____.	impeller ratio of the pump	speed of the impeller	pump capacity in gpm	height of the DC heater	
13	1738	B	Fuel oil may be discovered in the contaminated drain inspection tank when the _____.	steam atomizer leaks	fuel oil heater leaks	DC heater leaks	steam operated fuel oil pump leaks	
13	1739	C	A strong, well defined sound developed by the steam whistle, shown in the illustration, is obtained by adjusting the _____.	operating lever stroke	whistle valve travel	position of the back cover	number of diaphragms	GS-0099
13	1740	C	Modern day boiler automation allows bypassing the "flame safeguard" system to permit a burner to have a "trial for ignition" period during burner light-off. This period may not exceed _____.	5 seconds	10 seconds	15 seconds	30 seconds	
13	1741	D	A back pressure trip on an auxiliary turbo-generator functions to secure the device if the _____.	oil pressure is too low	discharge pressure of a turbine driven pump is excessive	gland seal leakoff pressure is too high	exhaust pressure rises above a preset limit	
13	1742	A	The function of downcomers installed in water-tube boilers is to _____.	accelerate of water circulation	decrease the end point for moisture carryover	distribute feedwater within the drum	decrease the rate of steam generation	

13	1744	B	If boiler priming occurs, you should immediately _____.	increase the steaming rate	reduce speed and open throttle drains	lift the safety valves with the hand easing gear	open the boiler bottom blow valve	
13	1745	B	The minimum design height of the DC heater is determined by the _____.	dew point temperature of the stack gases	minimum net positive suction head required by the main feedpump	maximum condensate pump discharge pressure	desuperheater outlet temperature	
13	1746	C	While underway at sea, the feedwater inlet temperature to a boiler economizer is determined by the _____.	dew point temperature of the stack gases	superheater inlet temperature	temperature of the HP turbine bleed	desuperheater outlet temperature	
13	1747	C	Which of the listed statements is true concerning the application and use of plastic fireclay furnace refractory?	The plastic fireclay refractory is especially resistant to slag buildup.	The plastic fireclay must be allowed to be completely air dry to achieve maximum strength.	Vent holes should be punched on approximately two-inch centers to provide for ready escape of trapped vapor during heating.	All of the above.	
13	1748	B	A leak in the heating coils of a fuel oil heater will first show up as _____.	water in the fuel oil supply	oil in the drain inspection tank	sputtering and hissing furnace fires	an intense white furnace flame	
13	1749	B	According to U. S. Coast Regulations (46 CFR), water-tube boilers shall be hydrostatically tested on passenger vessels every _____.	year	2 .5 years	5 years	8 years	
13	1750	A	If the gland assembly, shown in the illustration, is located at the forward end of the high pressure turbine, and the vessel is operating at minimum maneuvering speeds, which of the following statements is true?	Sealing steam would enter at "E".	Sealing steam would enter at "F".	Sealing steam would enter at "E" and "F".	This gland would be self sealing and provide sealing steam to the other glands.	SE-0006
13	1751	A	When a main propulsion turbine throttle malfunction develops, affecting both the main and secondary control stations, you should _____.	override the automated circuit and manually control the engine	override the automated circuit and shut down the engine	allow the automatic shutdown circuit to shut down the engine, then locate the problem	immediately make an entry in the engine log	
13	1752	D	Downcomers installed in water-tube boilers function to _____.	distribute feedwater within the water drum	decrease the end point for moisture carryover	accelerate the generation of superheated steam	accelerate water circulation in the boiler	
13	1753	B	Circulation of water and the steam/water mixture within a natural circulation boiler is retarded by _____.	large changes in steam density	fluid friction in the downcomers, drums, generating tubes, and headers	high feedwater pressure	back pressure in the steam drum acting on the user tubes	

13	1755	D	Machinery operating features are designed to help conserve energy. Which of the following will not contribute to a systems thermal efficiency?	Reduction of friction.	Insulation of hot surfaces.	Lubrication of moving parts.	Elevation of heat sink temperatures.	
13	1756	C	Coast Guard Regulations (46 CFR) concerning superheater safety valves require that the valve _____.	be set at a pressure higher than the drum safety valves	can only be operated by a pilot valve	nominal size is not less than 1.5 inches nor more than 4 inches	is not set at a pressure less than the feed pump relief valve	
13	1757	C	Which of the devices listed is used to convert thermal energy into rotor kinetic energy in a reaction turbine?	Nozzle diaphrams	Labyrinth nozzles	Moving blades	None of the above	
13	1758	D	A suspected leak in an operating fuel oil heating coil is normally confirmed by _____.	checking the pH of heating coil returns	conducting a soap test	conducting a blotter spot test	checking the drain inspection tank	
13	1760	D	In the illustration of a typical ship service turbogenerator control system, the handle labeled "B" is used to ____.	roll over the high speed pinion	pump up the lube oil manifold	bypass the governor control	reset the overspeed trip	SE-0009
13	1761	A	In steam turbine and reduction gear units, lube oil coolers installed in the lube oil system are located between the _____.	lube oil pumps and gravity tanks	gravity tanks and main unit	gravity tanks and lube oil sump	lube oil sump and lube oil pumps	
13	1762	D	Downcomers installed in water-tube boilers function to _____.	distribute feedwater within the water drum	decrease the end point for moisture carryover	cool the tubes adjacent to the burner throats	ensure proper circulation to the water wall headers	
13	1763	B	In the illustration of a typical ship service turbogenerator control system, the device that monitors turbine exhaust pressure is labeled _____.	K	J	M	F	SE-0009
13	1764	C	You would not see a flow through the bull's-eye of the lube oil gravity tank overflow line when the _____.	main engines are stationary at a stop bell	main engines are secured and the turning gear is engaged	the lube oil gravity tanks are being drained	main engines are turning at normal sea speed	
13	1766	C	If the main condenser were operating at a vacuum of 28.7"Hg, a condensate discharge temperature of 89°F, a seawater inlet temperature of 72°F, and a seawater outlet temperature of 79°F, what would be the condensate depression?	0.2 inches Hg	0.3 inches Hg	4.0 degrees Fahrenheit	12 degrees Fahrenheit	SG-0026
13	1768	C	A leak in a heating coil in a fuel oil storage tank should be detected quickly by _____.	an increase in fuel oil temperature	observing oil on the contaminated evaporator steam coils	the presence of fuel oil in the inspection tank	the sputtering of burners in the boilers	
13	1771	C	In a segmental pivoted-shoe thrust bearing, the thrust load among the shoes is equalized by the _____.	base ring	oil wedge	leveling plates	thrust collar	
13	1772	A	Downcomers are used in modern boilers to _____.	circulate water to the mud drum	cool the superheater	preheat the feedwater	remove soot from the firesides	

13	1778	B	Accumulation of fuel oil in the boiler double casing could be caused by _____.	leaking fuel oil strainers	dripping atomizers	high atomizing steam pressure	faulty steam atomizer return traps	
13	1781	D	Regarding the bearing shown in the illustration, "X" represents the _____.	template used for bearing offset	lower bearing half	upper bearing half	vacated bearing shell space	SE-0017
13	1782	A	Downcomers are frequently mounted outside the boiler casing on a water-tube boiler for the purpose of _____.	reducing heat in the downcomers and improving water circulation	improving the cooling of the lower tube banks	causing suspended solids in the boiler water to settle in the water drums	providing for easy maintenance and repair	
13	1788	C	Fuel oil accumulation in a boiler double front is caused by _____.	leaking fuel oil strainers	mismatch sprayer plates	dripping atomizers	insufficient air	
13	1791	D	Because of the pressure drop existing across each diaphragm, the flow of steam between the nozzle diaphragm and the rotor of the turbine is held to a minimum by _____.	a fluid seal	deflector rings	a babbitt liner	a labyrinth packing ring	
13	1792	D	The boiler economizer provides additional heat to the _____.	fuel oil entering the furnace	air supply entering the furnace	steam leaving the superheater	feedwater entering the boiler	
13	1798	A	Carbon deposits on the diffuser and register throat ring of a burner _____.	interfere with air flow around the burner	cause pre-ignition of the atomized fuel	allow heat loss to the boiler casing	are of no consequence and may be left in place until a fireside inspection allows time for removal	
13	1801	B	Most auxiliary turbines do not require an external source of gland sealing steam because they _____.	operate at relatively low pressures	exhaust to pressures above atmospheric pressure	utilize carbon packing rings at the low pressure end	operate with only a small amount of axial thrust	
13	1802	D	A check valve is located between the economizer and the steam drum to _____.	assure a positive feedwater flow through the economizer	assure a positive feedwater flow to the steam drum	prevent the feed pump from becoming vapor bound	prevent steam and water flow reversal from the drum should an economizer casualty occur	
13	1808	C	Which of the conditions listed could be responsible for the flame of a mechanical atomizer to blow out when attempting to light off?	The openings in the diffuser are improperly adjusted.	The radial air doors are closed.	The distance piece is improperly adjusted.	The viscosity of the fuel oil is too low.	
13	1812	A	One factor for determining the minimum feedwater inlet temperature to a boiler economizer is the _____.	dew point temperature of the stack gases	superheater inlet temperature	temperature of steam bled off the LP turbine	desuperheater outlet temperature	
13	1814	C	When preparing water-tube boilers for hydrostatic testing, they shall be filled with water at not _____.	more than 100°F	less than 80°F	more than 160°F	less than 100°F	

13	1818	C	Which of the following statements is true concerning the burner atomizer shown in the illustration?	The annular groove imparts the initial swirling motion to the oil.	The operating range, or 'turndown ratio', of this type of burner is almost unlimited.	The bore of the sprayer plate orifice has a standard drill size of "38".	All of the above.	SG-0022
13	1819	D	Heating the fuel oil to an excessively high a temperature in a fuel oil heater will cause _____.	a loss of fuel oil suction	overfiring the boiler	leakage at the burners	fouling of the heater	
13	1821	D	Large temperature and pressure drops in the first stage of a combination impulse and reaction turbine are caused by _____.	two rows of moving blades	steam passing through a single row of blades more than once	using a dummy piston and cylinder to offset axial thrust	a velocity-compounded impulse stage at the high pressure end of the turbine	
13	1824	C	To comply with Coast Guard Regulations (46 CFR), which type of boiler listed shall be subjected to a hydrostatic test at one and one half times maximum allowable working pressure?	All water-tube boilers once a year.	All water-tube boilers once every 4 years.	All water-tube boilers to which extensive repairs have been made.	All fire-tube boilers once every 2 years.	
13	1831	A	A sequential lift, nozzle valve control bar utilizes which of the following operating principles?	A lifting beam mechanism engages valve stems of varying lengths.	A hydraulic piston raises or lowers groups of valves according to pressure received from a governor.	A hydraulic piston raises or lowers individual valves according to pressure received from a governor.	A servomotor, mechanically connected to nozzle valve handwheels, opens or closes the valves in accordance with the type of electrical signal received.	
13	1838	B	Valve "H" shown in the illustration, functions to _____.	regulate the amount of fuel burned	provide a quick shut off of fuel to the boiler	prevent a backflow from the manifold	recirculate fuel oil during start-up	SG-0009
13	1841	A	What part of the turbine assembly is used to relieve strain on the turbine caused by thermal stress?	Flexible I-beam	Rigid mountings	Curved steam lines	Babbitt lined bearings	
13	1842	A	Whenever operating a boiler, whose economizer is bypassed, always keep in mind that _____.	it is necessary to fire more fuel to maintain the required evaporative rating	there is always the danger of metal oxidation in the economizer	less heat is actually being transferred to the steam because of the decrease in the ratio of gas to steam weight	all of the above	
13	1848	D	When sputtering is detected in the boiler fires indicating water in the fuel, which of the procedures listed should be followed?	Start the standby fuel service pump.	Increase the fuel service pump speed.	Increase the furnace air supply pressure.	Shift to the settler high suction.	
13	1850	A	Contaminated steam generators are usually _____.	single effect	double effect	triple effect	multistage flash type	

13	1852	B	When forced draft blowers are provided with high and low speed controls, it is advisable to run the blowers at high speed during maneuvering to _____.	keep the forced draft discharge dampers open wide	permit full maneuvering capability without the necessity of changing blower speed	maintain a constant air/fuel ratio	ensure that all burners will remain ignited at low load	
13	1854	D	Coast Guard Regulations (46 CFR) require unfired pressure vessels with manholes to be hydrostatically tested _____.	every four years	every eight years	at each certification inspection	at the discretion of the marine inspector	
13	1858	C	In the operation of a lube oil clarifier, the position of the oil-water interface should be _____.	maintained by the ring dam	maintained by the number of disks in the disk stack	nonexistent	maintained by the diaphragm-type, weir control valve	
13	1860	B	The purpose of a contaminated steam system is to _____.	distill water from a harbor	ensure fouled heating coil returns from fuel tanks do not contaminate boiler feedwater	distill makeup feed for use as potable water	ensure an uncontaminated source of feed for the makeup evaporator	
13	1861	A	The component of a Kingsbury thrust bearing which transmits the thrust from the shaft to the oil film and shoes is the _____.	collar	lower leveling plate	upper leveling plate	base ring	
13	1862	A	The purpose of the prerotation vane damper installed in a boiler forced draft blower is to _____.	control the air volume to a steaming boiler	prevent air from entering an idle boiler furnace	provide a natural draft when the blower is secured	equalize the forced draft air between steaming boilers	
13	1864	D	Which of the following statements is true concerning the inspection of water-tube boilers?	All mountings shall be opened up and examined by a Coast Guard inspector at eight year intervals after the initial inspection.	All boiler mounting studs or bolts shall be removed for examination by a Coast Guard inspector every 4 years after initial inspection.	Boiler mountings attached to boiler nozzles must be opened and removed for examination every 8 years.	Boiler mountings attached directly to the boiler plating by screwed studs and nuts shall be removed and examined every 10 years.	
13	1870	C	A contaminated steam generator is used to produce saturated vapor from collected _____.	bilge water	sanitary water	fuel oil heating return drains	condenser cooling water	
13	1871	C	Failure to use the turning gear prior to warming up a main turbine will damage the _____.	thrust bearings	gland sealing system	rotor assembly	nozzle located in the diaphragm	
13	1872	B	What is the advantage of a forced water circulation boiler over a natural circulation boiler?	The circulating pump need not operate when low pressure steam is required.	Boiler tubes are less likely to overheat.	A steam accumulator is not required.	All of the above.	

13	1874	A	Coast Guard Regulations (46 CFR) require that main steam piping must be hydrostatically tested at specified intervals. If the pipe insulation cannot be removed during this test, the piping shall be tested at _____.	1 1/4 times the maximum allowable working pressure and the pressure maintained for 10 minutes	1 1/2 times the maximum allowable working pressure and the pressure maintained for 20 minutes	operating pressure and temperature and the pressure maintained for 1 hour	a pressure and temperature specified by a Coast Guard marine inspector	
13	1881	B	Why is a flexible I-beam rigidly mounted at the forward end of the main turbine?	To relieve stress on the hull.	Allow for turbine casing expansion and contraction.	To relieve stress at the light end of the turbine.	Prevent the reaction developed within the turbine from being transmitted to the hull.	
13	1882	B	If a feed pump failure causes the boiler water to drop out of sight in the gage glass, the engineer should FIRST _____.	secure the fires, steam stops and then add water	secure the fires, reduce steam load and start standby feed pump	reduce the steaming rate and then cool the boiler with the force draft fan	reduce the steaming rate and then add water	
13	1884	C	Steam piping subject to main boiler pressure must be hydrostatically tested at specified intervals. Therefore, which of the following statements is true?	The piping must be tested at a pressure and temperature specified by a Coast Guard marine inspector.	The piping must be tested at 1 1/2 times working pressure every 4 years.	Piping under 3 inches nominal pipe size need not be hydrostatically tested.	The piping must be tested at 1 1/2 times maximum allowable pressure every 4 years.	
13	1891	D	When starting a turbogenerator, you must provide lube oil pressure to the unit by means of _____.	a line from the other generator	a line from the gravity tank	the main lube oil pump	the hand operated or auxiliary lube oil pump	
13	1892	C	Lower than normal steam pressure in an operating boiler may be caused by _____.	a sudden drop in superheater outlet temperature	high feedwater temperature	a low water level in the steam drum	boiler water contamination	
13	1902	B	Which action should be taken if the water level in the gage glass drops out of sight and the burner fails to secure automatically?	Blowdown the gage glass.	Trip the master solenoid.	Increase the feed pump speed.	Repair the feedwater regulator.	
13	1904	B	Coast Guard Regulations (46 CFR) require that boiler mountings shall be removed and studs examined by a Coast Guard inspector _____.	every 4 years	every 10 years	when the boiler is hydrostatically tested	at each inspection for certification	
13	1907	A	The water seal used in a tubular bowl centrifugal purifier is kept in the bowl during normal operation by _____.	an inclined port or passage rising from the bowl side towards the center	an inclined port or passage rising from the center towards the bowl side	baffled orifice	top cover	GS-0124

13	1911	B	A hydraulic governing system for a turbogenerator unit maintains constant turbine speed by using a governor flyweight-actuated pilot valve to control oil flow and to directly _____.	change the position of the turbine throttle valve	change the position of the governor lever	vary steam pressure in the steam chest	regulate back pressure	
13	1912	A	The water level in one boiler of a two boiler plant rapidly falls out of sight, which of the following actions should be carried out FIRST?	Secure the fuel oil to the low water boiler.	Raise the feed pump pressure.	Blowdown the gage glass.	Have the engineer on watch wait for help	
13	1917	D	The rotating speed of the tubular bowl centrifuge is more than twice that of the disk type. The reason for this is _____.	a narrow diameter bowl is not effected as much by windage losses as a larger diameter bowl	the friction affecting rotation is not as significant with a narrow diameter bowl	the drag bushing is used to permit the higher speed of rotation	to produce a nearly equal magnitude of centrifugal force	
13	1921	D	The reversing turbine is normally used for which of the following operations?	Emergency stopping	Backing	Maneuvering	All of the above.	
13	1924	A	Which of the following statements is true concerning boiler inspections?	The marine inspector may require any boiler to be drilled to determine its actual thickness any time its safety is in doubt.	At the first inspection for certification after a water-tube boiler has been installed for ten years, it shall be gaged by drilling to determine the actual extent of deterioration.	If the thickness found as a result of gaging is less than original thickness, the boiler must be condemned.	Any user of a nondestructive testing device must demonstrate that results with an accuracy of plus or minus one percent are consistently obtainable.	
13	1927	A	When a lube oil purifier has been cleaned, but a small amount of sludge remains in one spot of the bowl side, the _____.	seal will be gradually lost after being placed into operation	through put will be reduced	temperature of the oil input will have to be lowered	dirty oil pump discharge pressure will need to be increased	
13	1931	B	Which of the devices listed is used to compensate for the expansion and minor misalignments occurring between the main turbines and the reduction gears?	Sliding sleeve	Flexible coupling	Expansion gear	Quill shaft	
13	1934	A	In accordance with Coast Guard Regulations (46 CFR), which of the following statements is true concerning safety valve construction and/or operation used on propulsion boilers?	Not have threaded inlets for valves larger than 2".	Gagging a safety valve by means of a set screw through the cap when gags are unavailable is acceptable only when conducting a hydrostatic test.	After the valve is set and adjusted, the tolerance in popping and reseating pressures shall not vary more than plus or minus 1 1/2%.	All of the above.	

13	1937	C	The disk stack and tubular shaft used in a lube oil centrifugal purifier, is forced to rotate at bowl speed by _____.	the use of an acme thread screw	wire springs	the locating pin	the drive pin	
13	1941	D	Reduction gears for main propulsion turbines are lubricated by _____.	grease cups and gravity feed lines	oil flinger rings mounted on the shaft	leak off lines from the lube oil cooler	spray nozzles at the gear meshing points	
13	1944	B	If the maximum steam generating capacity of a boiler is increased Coast Guard Regulations (46 CFR) require that the safety valves' _____.	lifting pressure be increased	relieving capacity be checked	reseating pressure be increased	blowdown be reduced	
13	1951	D	Which of the listed parts of a Kingsbury thrust bearing tilts to permit the formation of a wedge shaped film of oil?	Collar	Lower leveling plate	Dowel disk	Shoes	
13	1954	B	Coast Guard Regulations (46 CFR) state that main propulsion water-tube boilers are not required to be fitted with a surface blow off valve if the design pressure is _____.	300 psig (2169 kPa) or over	350 psig (2413 kPa) or over	500 psig (3548 kPa) or over	550 psig (3893 kPa) or over	
13	1957	B	If the bowl of a centrifugal purifier is improperly reassembled with O-ring seals that have become hard and flat, the centrifuge _____.	bearings will be permanently damaged	will begin to lose its water seal	will discharge oil to the main sump as dirty as the input	bowl will rotate at a lower speed	
13	1961	D	Why are convergent-divergent nozzles used in high-pressure turbine applications?	They are easy to manufacture.	They are less susceptible to steam erosion than other nozzle types due to their shape.	They produce a larger pressure drop and therefore are more efficient than other nozzle types.	They direct the steam flow more efficiently than other nozzle types.	
13	1967	D	When water is removed from lube oil passing through a centrifugal purifier, the water removed will _____.	be retained in the bowl	force the diameter of the oil column within the bowl to be narrowed	displace water from the heavy phase discharge port, but of an amount less than that removed from the oil	displace an equal amount of water from the bowl seal	
13	1971	D	Which of the parts listed for a reaction turbine serve the same function as the nozzles of an impulse turbine?	Fixed nozzles	Moving nozzles	Moving blades only	Fixed blades and moving blades	
13	1981	C	Which of the following statements would best describe the purpose of rotating the hand operated lube oil pump on an auxiliary turbo-generating unit?	It supplements the main lube oil pump flow while paralleling the generators.	It empties the governor control reserve prior to shutting down.	It assists in opening the governor control valve while starting the unit.	It permits the changeover of lube oil filters.	

13	1987	B	Which of the following statements is true concerning the centrifuging of lubricating oil?	Centrifuging is more effective with inhibited oils than straight mineral oils.	Centrifuging is more efficient when the oil is preheated prior to centrifuging.	Silicones are water soluble and easily removed by centrifuging.	Centrifuging will purge the oil of various contaminants, including acids and alkalis.	
13	1991	D	In addition to the direction of steam flow, which of the descriptions listed may also be used to classify turbines?	The method in which the steam causes the turbine rotor to rotate.	The type of staging and compounding of steam pressures and velocities.	The division of the steam flow.	All of the above	
13	2001	C	Which of the following statements describes how the main propulsion turbine overspeed relay initiates closing of the throttle valve?	Excessive centrifugal force causes a spring loaded weight to trip a valve latch.	Excessive centrifugal force causes spring loaded flyballs to actuate a control lever.	Excessive speed causes an oil pump to develop sufficient pressure to open a spring loaded relay valve which tends to close the steam control valve.	Excessive speed causes an increase in lube oil control temperature which actuates a solenoid oil dump valve.	
13	2002	C	If the engineer on watch has reason to doubt the accuracy of the water level shown in the boiler gage glass, he should _____.	speed up the main feed pump	open the auxiliary feed line	blowdown the gage glass	start the standby feed pump	
13	2011	B	In the operation of a main propulsion turbine, using bar-lift throttle valve control, the successive opening of the valves _____.	admits more steam to the steam chest	increases the steam flow to the HP turbine first stage	increases the pressure of steam in the steam chest	bypasses the flow of steam directly to the later turbine stages	
13	2014	C	According to Coast Guard Regulations (46 CFR), what is the minimum flash point of oil to be used as fuel for the boilers?	80°F (26.7°C)	110°F (43.3°C)	140°F (60.0°C)	150°F (65.6°C)	
13	2017	B	In a disk type centrifugal purifier, the contaminated oil enters the bowl _____.	at the bottom through the oil inlet	at the top through the regulating tube	through the neck of the top disk	through the funnel body	
13	2021	B	Which of the descriptions listed applies to a Rateau stage?	One set of nozzles and two rows of moving blades.	One set of nozzles and one row of moving blades.	Two sets of nozzles and two rows of moving blades.	Two sets of nozzles and one row of moving blades.	
13	2022	C	One boiler of a two boiler plant has ruptured a tube and the water cannot be maintained in sight in the gage glass. After securing the fires, your next action should be to _____.	secure the forced draft fans	stop the fuel oil service pump	secure the feedwater supply to the boiler	close the main steam stop	

13	2024	A	46 CFR Parts 59 and 35 require that _____.	the OCMI be notified of emergency repairs to boilers and unfired pressure vessels	the fuel burned in boilers of tankships shall have a flash point of not less than 130°F	a one pint sample of each load of fuel be drawn and sealed at the time of supply and preserved until that fuel is exhausted	all of the above	
13	2031	B	Which of the following methods is used to lubricate main propulsion turbine reduction gears?	The gears run through an open oil sump and oil is carried along on the gear teeth.	Oil is sprayed through nozzles at the point of gear mesh.	Oil is pressure fed through internal drilled passages which force oil to the gear's periphery.	Oil rings in channels outside the gears dip into oil in the sump and carry it to the gear teeth.	
13	2032	C	If a tube failure results from low water level and you cannot maintain water in sight in the gage glass, you should _____.	immediately secure the forced draft fans	increase the feed pump speed to maximum	immediately secure the fuel oil supply to the burners	blowdown the gage glass to verify a low water condition	
13	2034	C	Should one boiler on a two boiler vessel suffer serious tube damage, the Officer-in-Charge, Marine Inspection may issue a permit (Form CG-948) to proceed to another port for repair _____.	only if the vessel's Certificate of Inspection is valid and has not expired	as long as no cargo or passengers are being carried	only upon written application of the master, owner, or agent of the vessel	all of the above	
13	2041	C	Which of the following enables a Kingsbury, or any pivot shoe type thrust bearing, to bear a much greater load per square inch of working surface than parallel surface bearings?	The thickness of the filler piece behind the pivotal-shoes is adjusted to obtain a more accurate fit.	Clearances are automatically adjusted to the correct value when wear occurs.	The shoes tilt slightly thereby allowing the formation of a wedge shaped oil film under a thrust load.	The shoes pivot, thus remaining parallel with the collar when thrust loads are applied.	
13	2042	A	Which of the following actions should be carried out if the boiler water level is falling due to a tube failure?	Secure the fires and try to maintain the water level.	Speed up the feed pump to keep the water level up while firing the boiler.	Open the auxiliary feed stop and check for extra feed.	Start the standby feed pump and feed the boiler using two feedpumps.	
13	2044	B	According to Coast Guard Regulations (46 CFR) a 'oil fuel unit' is correctly described by which of the following statements?	The amount of heat released by burning a 'unit' amount of fuel oil.	Equipment used for the preparation of fuel oil for delivery to an oil fired boiler.	The amount of thermal units required to raise the temperature to the flash point in an open cup tester.	The amount of thermal units necessary to cause a liquefied flammable gas to exceed a certain Reid vapor pressure.	
13	2049	B	The maximum temperature rise of oil passing through any reduction gear set, or bearing, should not exceed _____.	30°F (16.7°C)	50°F (27.8°C)	70°F (38.9°C)	90°F (44.5°C)	

13	2051	B	During a maintenance inspection of a turbogenerator, the integral turbine wheels are tapped with a hammer. What condition may be indicated by a dull, non-resonating sound?	Normal structural solidity	A cracked turbine wheel	Overstressed blade shrouding	Improper rotor support	
13	2061	D	Which of the following designs is an essential feature of the Rateau type turbine?	A large pressure and temperature drop occurring in the first stage.	The use of alternate rows of fixed and moving blades.	The use of a velocity-compounded impulse stage installed at the high pressure end of the turbine.	Two or more simple impulse stages aligned in tandem in one casing.	
13	2062	B	The fireman/watertender secures the fires because there is no visible water level in the gage glasses of a steaming boiler. Upon inspection, you observe condensate trickling down the inside of the gage glass. This indicates _____.	high water level	low water level	priming	steam binding of the feedwater regulating valve sensing line from the top of the steam drum	
13	2071	A	A turbogenerator back pressure trip can be actuated as a result of _____.	insufficient circulating water flow through the condenser	a steam inlet valve being partially open	an excessive pressure drop through the turbine	excessively low exhaust pressure	
13	2091	A	A pilot valve and servomotor are utilized in mechanical-hydraulic governing systems in order to _____.	provide sufficient force to operate large steam control valves	provide a means of operational hunting	attain 100% of regulation with zero speed droop	All of the above are incorrect.	
13	2092	C	After the main engine has reached full sea speed, which of the following conditions could cause the water level in the boiler steam drum to keep falling?	Open cutout valves on the boiler gage glasses.	Condensate recirculating line is excessively open.	Feed pump discharge pressure is set too low.	Feed pump recirculating valve is closed.	
13	2101	D	Which of the following statements represents the significance of the differential pressure existing between the nozzle block and steam chest of a turbogenerator equipped with a lifting beam mechanism?	The pressure differential necessitates the use of special spherical valve seating surfaces.	The pressure differential eliminates the possibility of valve binding in the lifting beam.	The pressure differential requires the installation of a special biasing spring to open the valves.	The pressure differential assists in seating the valves when the lifting beam is lowered.	
13	2121	B	Fine metallic particles, which may originate from wear or failure of the lube oil service pump internal parts, are prevented from contaminating the bearings served by the lube oil system by _____.	the settling action of solid matter in the gravity tank	use of the magnetic strainers in the lube oil service pump discharge piping	the change of direction and settling action within the lube oil coolers	batch centrifuging the lube oil at least once a week	
13	2131	C	In a double reduction gear, the function of a quill shaft is to provide flexibility between the second reduction pinion and the _____.	bull gear	second reduction gear	first reduction gear	first reduction pinion	

13	2141	A	One of the most effective methods of improving purification in tubular and disk type centrifugal purifiers is to _____.	decrease the viscosity of the oil by heating	increase the pressure at which the oil is fed through the purifier	match the discharge ring size outside diameter with the lube oil's specific gravity	use the smallest inside diameter of the discharge ring size without a loss of oil with the discharge water	
13	2142	C	The internal feed pipe of a power boiler distributes the feed water into the _____.	mud drum	water drum	steam drum	economizer	
13	2150	B	While making engine room rounds at sea, you observe excessive steam leaking from the forward gland on the high pressure turbine. This may indicate that the _____.	turbine is operating at low speed	gland seal leakoff line is obstructed	main condenser vacuum is too high	drains were left open	
13	2151	C	Which of the following is used to hold the poppet valves closed in the turbine nozzle control valves?	Lifting beam	Springs	Steam pressure	Oil pressure	
13	2152	A	Which of the devices listed is used to convert thermal energy to useful mechanical work?	Turbine	Condenser	Air ejector	Each of the above	
13	2161	A	When starting a turbine driven boiler feed pump with the recirculating valve open, which of the following valves should be closed?	Pump discharge valve	Pump suction valve	Turbine steam supply valve	Turbine exhaust valve	
13	2171	A	Which of the turbines listed is part of a cross-compound system and when operating receives steam that has passed through another turbine?	Low pressure turbine	High pressure turbine	Back pressure turbine	Astern turbine	
13	2172	C	The greatest heat loss in an oil fired boiler is from _____.	blowdown	radiation in the furnace casing	uncontrolled escape of combustion gases up the stack	incomplete combustion	
13	2175	B	The three-wing device used in the tubular bowl purifier, is held in place and forced to rotate at bowl speed by the _____.	vertical shallow grooves machined into the bowl surface	flexible wire springs secured to the edge of each 'wing'	locating pin pressed into the top edge of the three-wing device	drive pin pressed into the interior surface of the bowl	
13	2181	D	The overspeed tripping device installed on an auxiliary turbine is automatically actuated by _____.	pneumatic force	hydraulic pressure	high back pressure	centrifugal force	
13	2183	C	A centrifugal oil purifier should be shut down if the _____.	presence of oil is indicated in the gravity tank bull's-eye	observation cover clamp needs tightening	purifier is vibrating badly	trapped water is discharged from the overflow line	
13	2188	B	If one fuel strainer of a duplex strainer unit becomes clogged while your vessel is underway, you should first _____.	secure the engine immediately	change the oil flow over to the clean side	stop the fuel oil pump	open the strainer bypass valve	
13	2191	C	The valve opening sequence for bar-lift nozzle control valves in a marine steam turbine is determined by _____.	the turbine idle speed	pilot valves which initiate movement of each individual valve bar	the distance between the top of the bar and the adjusting nuts on the valve stems	electro-hydraulic servomotors attached to individual valve stems	

13	2192	D	The proper way to quickly reduce high water level in a steaming boiler is to use the _____.	bottom blow valve	safety valve	water column valve	surface blow valve	
13	2201	C	Axial thrust developed in a reaction turbine is the result of a steam pressure drop in _____.	the nozzles	the stationary blades	the moving blades	both the moving and stationary blades	
13	2211	A	What type of strainer is used in a turbine lube oil system to remove metallic particles?	Magnetic basket strainer	Simplex filter	Metal edge strainer	Fuller's earth filter	
13	2221	D	The function of a quill shaft used on a double reduction gear main propulsion unit is to _____.	allow for gross radial misalignment of the high-speed pinion	reduce backlash in the reduction gear	allow for flexibility between the high-speed pinion and first reduction gear	allow for axial flexibility between the first reduction gear and second reduction pinion	
13	2231	C	Why do double flow reaction turbines produce very little axial thrust?	Because there is never any axial thrust developed.	Because partially expanded steam is exhausted to another low pressure turbine where the expansion is completed.	Because the axial thrust is developed at each end in opposite directions to counterbalance each other.	Because equalizing holes are provided in the turbine wheels.	
13	2241	A	The labyrinth seals used on rotating steam turbine shafts reduces external leakage by causing _____.	successive pressure drops through the seal stages	successive temperature drops through the seal stages	pressure increases through successive seal stages	increased turbulence through successively larger labyrinth clearances	
13	2251	D	Why are geared turbine installations equipped with turning mechanisms?	For jacking the main engine over periodically when secured.	For turning the main engine during routine inspections.	For turning the main engine during warm-up and securing operations.	For all of the above purposes.	
13	2252	C	Which of the following statements is true concerning the main steam stop valves on multiple boiler installations incorporating uncontrolled superheaters?	When only one valve is used, it must be of the stop-check type.	The resistance to closing increases as the cross-sectional area of the valve seat opening decreases.	A six inch main steam stop must be fitted with a bypass for heating of the line and equalizing the pressure before the valve is opened.	All of the above.	
13	2261	B	To prevent damage to the turning gear mechanism, which of the following procedures must be carried out before the turning gear is engaged?	The brake on the first reduction worm shaft must be set.	The propeller shaft must be stopped and held stationary until the clutch is engaged.	The engine order telegraph must be on 'stop'.	The speed of the astern turbine must be reduced.	

13	2271	B	If two turbo-generators with the same no-load speed settings are operating in parallel, the unit whose governor has the lesser speed droop will _____.	assume the smaller share of the load	assume the larger share of the load	have poor sensitivity characteristics	have poor power response	
13	2272	C	Water circulates within a natural circulation boiler as a result of the _____.	difference in the tube length and diameter	angle of tube inclination	differences in density within the circulating medium	difference between the heights of the boiler drums	
13	2281	C	The turning gear mechanism of a geared turbine installation is designed to turn the main engine at a rate of speed that is _____.	approximately equal to their normal operating speeds	approximately equal to their maximum operating speeds	very slow in relation to their normal operating speeds	very fast in relation to their normal operating speeds	
13	2291	B	Which of the devices listed is used to engage the main engine turning gear to the high pressure turbine high-speed pinion?	Manually operated band brake	Manually operated jaw clutch	Sleeve coupling	Quill shaft	
13	2301	B	Main steam turbine lubricating oil systems are fitted with _____.	floating strainers	magnetic strainers	centrifugal strainers	cestus strainers	
13	2302	C	Water circulates in a natural circulation boiler due to the _____.	difference in tube length and diameter	angle of inclination	difference in density between the water and the steam/water mixture	difference between the heights of the boiler drums	
13	2311	A	Flexible couplings used in modern turbine reduction gear installations would include _____.	gear or dental	grid	nonmetallic	labyrinth	
13	2321	A	In which type of turbine listed does the same turbine wheel use the steam flow more than once?	Helical flow	Axial flow	Axial and radial flow	Helical and axial flow	
13	2331	B	As indicated in the graph, what percentage of rated horsepower is being used to operate the main propulsion turbine at 30% speed?	1%	4%	10%	40%	SE-0018
13	2332	C	The proportion of downcomers installed in relation to riser tubes in a vertical tube type of boiler, is dependent upon the _____.	degree of superheat	type of water level control	steam output of the boiler	position of the mud drum	
13	2341	B	A steam driven 750 KW turbogenerator has a rated speed of 1200 RPM. The overspeed setting for this unit must have a maximum limit of _____.	1320 RPM	1380 RPM	1440 RPM	1500 RPM	
13	2351	B	If the main propulsion turbine speed percentage is increase from 30% to 60%, what percentage of horsepower is required when the new speed is attained as shown in the illustrated graph?	10%	20%	30%	40%	SE-0018
13	2352	D	Which of the following precautions should be taken prior to lighting off a boiler?	Secure the main steam line drains.	Close the air register.	Bottom blow the mud drum.	Purge the furnace of combustible gases.	

13	2361	D	Inefficient operation or a faulty condition of turbine components will be indicated by an abnormal variation of which condition?	Speed	Vibration	Lubricating oil temperature	All of the above conditions are individually correct.	
13	2371	A	The safety device provided on a turbogenerator which closes the throttle automatically when exhaust pressure reaches a preset maximum is called a/an _____.	back pressure trip	low pressure trip	emergency hand trip	overspeed trip	
13	2381	C	Constant speed governors are normally employed with _____.	cruising turbines	high pressure turbines	turbogenerator units	variable speed turbines	
13	2391	B	The steady frequency required from a ship service generator for electrical power is maintained by means of a _____.	throttle control mechanism	constant speed governor	speed limited governor	cam operated nozzle control valve	
13	2401	A	On main turbine propulsion units, flexible couplings are used between the _____.	rotor shaft and pinion shaft	rotor shaft and quill shaft	quill shaft and high speed pinion	second reduction and the shaft thrust bearing	
13	2402	D	The primary purpose of screen tubes installed in a marine boiler is to _____.	act as internal downcomers	protect the furnace casing and retain furnace heat	protect the generating tube bank from the convectional heat transfer	protect the superheater from radiation heat transfer	
13	2411	C	Regarding the governor shown in the illustration, what would occur as the result of a speed increase by a ship's service turbogenerator?	The governor weights will move inward.	The lifting beam is raised.	The pilot valve bushing is lowered.	Oil is pumped into the operating cylinder.	SE-0009
13	2412	B	Which of the following problems can occur when an excessive number of water screen tubes are plugged?	Superheater outlet pressure will rise.	Superheater outlet temperature will rise.	Steam pressure leaving the drum will increase.	Steam temperature in the drum will decrease.	
13	2421	C	Which of the listed actions will occur when there is an increase in load on a ship service generator equipped with a centrifugal type hydraulic governor?	The governor weights move outward.	The operating piston is forced to move lower.	More oil will enter the operating cylinder.	Steam flow to the turbine decreases.	SE-0009
13	2431	C	The adjustable spherically seated self-aligning bearing housings used in main turbines are provided with oil deflector rings. The function of these rings is to _____.	ensure efficient lubrication of the bearing	prevent the leakage of main steam into the oil	prevent the external leakage of oil out of the bearing housing	direct the flow of oil through the bearing	
13	2432	C	Which of the listed components is used to protect the boiler superheater against the radiant heat of the furnace?	Superheater support tubes	Control desuperheater	Screen tubes	Generating tubes	
13	2441	B	In the reduction gearing for a typical ship service turbogenerator, the oil pump and governor drive gear are mounted on the turbine end of the _____.	high speed pinion shaft	reduction gear wheel shaft	medium speed generator shaft	low speed turbine shaft	SE-0009
13	2451	C	In a modern main propulsion turbine installations, lube oil system strainers are usually located in the _____.	bearing supply line	gravity tank overflow line	pump suction line	gravity tank discharge line	

13	2461	B	In steam turbine main engine installations, how are the main reduction gear bearings identical to other radial bearings?	They are of the single casting type bearing.	They are babbitt-lined bearings.	They are self-aligning bearings.	They are spherical seated bearings.	
13	2469	C	Using a dry uncoated sounding rod or tape to measure the depth of water in a reserve feed water tank will _____.	always be 100% accurate	thoroughly contaminate the feed water	be very inaccurate	be satisfactory if a small amount of oil is floating on the surface	
13	2471	A	Which of the following types of bearings are used as line shaft bearings?	Ring-oiled, babbitt-faced, spherical seat, shell	tapered roller, split type radial	Segmental, pivoted-shoe thrust	Rigidly mounted, radial sleeve	
13	2481	C	Which of the devices listed are used to rigidly mount reduction gear bearings in their housings?	Keyways and keys	Spherical housings	Dowels or locking screws	Notched construction	
13	2491	C	The most likely effect of water slugging in the steam supply to a ship service turbogenerator is _____.	excessive shaft seal wear	contamination of the lube oil	damage to the turbine blades	rapid erosion of labyrinth packing	
13	2492	C	Which of the conditions listed occurs when glassy slag, formed by the burning of fuel oil contaminated with salt water, melts and runs over the furnace wall?	Formation of a protective coating.	Increased furnace temperature.	Damage to the furnace refractory.	Cracks through the furnace floor.	
13	2501	D	The splits located in the halves of main reduction gear bearings are aligned at an angle to the horizontal in order to resist _____.	oil loss	steam loss	axial stress	wiping	
13	2506	B	To properly sound a reserve feed water tank, you should use a/an_____.	innage sounding tape	chalk coated calibrated metal rod	manila line with an attached weight	fuel oil settler ullage tape	
13	2511	B	A motor driven synchronizing device, figure "D" shown in the illustration, operated from the generator switchboard, initiates fine adjustments to the steam turbine speed by directly _____.	raising or lowering the nozzle block lifting beam	changing the vertical location of the pilot valve bushing	increasing or decreasing operating spring pressure	varying the pivot rod stroke length, and bearing on the governor weight eccentric pad	SE-0009
13	2520	A	Which possible condition has occurred if a vacuum is present at the atmospheric drain tank vent while the vessel is underway?	The control valve regulating flow to the main condenser is stuck in an open position.	The control valve ball float has been holed causing the ball to remain in a lowered position.	There is a definite possibility of the tank overflowing causing loss of distilled water.	There will be an increase of vacuum in the main condensor within a short period of time.	
13	2521	C	The transfer of the heat produced by friction in the bearings to the lube oil is assisted through the use of _____.	rollers	monel linings	babbitt linings	a dowel	
13	2530	D	The level of the drain inspection tank continually decreases after steam is admitted to a double bottom tank fuel oil heating coil. You can expect _____.	proper heating of the fluid	higher than normal temperatures	a leaking makeup feed regulator	a perforated heating coil	

13	2531	C	Which of the following statements describes the function of a ship's propulsion plant main reduction gear thrust bearing?	Support the weight of the reduction gears.	Absorb the transmitted power when radial thrust is developed.	Absorb the axial thrust transmitted through the shaft from the propeller.	To absorb only the thrust developed by the high pressure turbine.	
13	2541	A	Turbine lube oil suction strainer baskets have _____.	course perforations	fine perforations	frame lined with wire cloth	self-cleaning design	
13	2551	C	Which of the following operational practices is helpful in avoiding the accumulation of condensate in the main reduction gear casing?	Always ensure that the lubricating oil pressure is 14-17 psi when operating in unusually cold waters.	The temperature of the lubricating oil should not exceed the gear manufacturer's recommendation when the unit is operating at full load.	After the main unit is secured, lubricating oil should be circulated until the temperature of the oil and reduction gear casing approximates the engine room temperature.	Avoid applying gland sealing steam to the low pressure turbine until you are ready to start up the first-stage air ejector.	
13	2561	A	Which of the bearings listed is used in some turbines to limit axial movement?	Pivoted-shoe type thrust bearing	Self-adjusting, spherically-seated, self-aligning bearing	Journal bearing	Cylindrical bearing	
13	2571	D	The Kingsbury bearing is equipped with pivoted shoes in order to _____.	absorb radial stress	compensate for shaft misalignments	keep the sleeve from turning	maintain a wedge-shaped oil film	
13	2581	D	Which of the listed parts illustrated in the turbogenerator governing system, provides the follow-up to prevent the nozzle valves from cycling between the fully open and fully closed positions, with each variation in turbine speed?	D	O	H	E	SE-0009
13	2591	D	Which of the features listed, regarding the Kingsbury thrust bearing, prevents the base ring from turning and secures it to its housing?	Pin	Dowel	A combination of pin and dowel	Keyed construction	
13	2601	D	In a reduction gear train, a quill shaft of high torsional flexibility provides _____.	self-adjustment of the pinion gear shaft	rigidity between the elements of the gear train	efficient distribution of oil to the various elements of the gear train	equal distribution of the load among the various elements of the gear train	
13	2602	C	The steam drum in a D-type marine boiler _____.	maintains circulation by forcing steam bubbles downward in the generating tubes	supports the superheater tube bank	provides a space for moisture to separate from the steam	acts as a receptacle for heavy suspended solids in boiler feedwater	
13	2611	B	Which of the flexible coupling types listed is used in most turbine reduction gear installations?	Friction clutch	Gear	Bend	Flange	

13	2612	B	When two or more boilers provide steam flow to a common main steam line, each boiler main steam line shall be fitted with a main steam stop valve and a/an _____.	auxiliary steam stop valve	stop-check valve	swing check valve	gate valve	
13	2621	B	Which of the following factors determines the type of construction used for gear hubs in shipboard reduction gear units?	Size of the gear wheel	Type of reduction gear unit	Type of ship using installation	Type of steam turbine installation	
13	2622	B	Which of the conditions listed could cause steam formation in the economizer?	Excessive water flow rates.	Sudden increase in the firing rate.	Soot buildup on the gill rings.	An open main feed pump recirculating line.	
13	2631	D	In which of the following lube oil lines should you expect to find an illuminated sight glass (bull's-eye)?	Lube oil pump suction	Lube oil pump discharge	Gravity tank discharge	Gravity tank overflow	
13	2632	A	The phenomenon called 'shrink' causes an apparent drop in the water level of a steaming boiler. This phenomenon is caused by a/an _____.	collapse of steam bubbles	excessive formation of steam bubbles	sudden decrease in steam pressure	rapid increase in feed rate	
13	2641	A	Fresh water accumulating in the reduction gear sump may be directly attributed to a/an _____.	inefficient gland sealing system	faulty turbine casing drain valve	lube oil cooler tube leak	fractured main condenser support sheet	
13	2642	D	Before using a boiler compressed air soot blower system, you should _____.	reduce the boiler pressure	lower the water level	decrease the forced draft fan speed	drain the soot blower pneumatic operating lines	
13	2651	C	The pinion gears used in main propulsion reduction gear mechanisms are generally constructed of _____.	aluminum	bronze	forged steel	cast steel	
13	2652	A	Which of the listed conditions causes shrinkage in boiler water levels?	Collapse of steam bubbles	Excessive steam bubbles	Sudden increase in feedwater temperature	Sudden decrease of drum pressure	
13	2661	B	In main propulsion systems, which metal is used in the construction of the shafts for a main reduction gear unit?	Aluminum-bronze	Forged steel	Aluminum	Cast steel	
13	2662	C	The effects of shrink and swell on boiler water levels can be minimized by _____.	providing a constant surface blow	rapidly opening and closing the throttles during maneuvering	avoiding rapid opening and closing of the throttles while answering bells	installing an automatic single-element feedwater regulator	
13	2671	B	In marine articulated double reduction divided power path gear sets, the first and second reduction gears are usually of fabricated construction. Why are the gear teeth usually cut in a temperature controlled room?	To prevent stress buildup.	To prevent ambient conditions from affecting the machining process.	To control the size of the journals.	To control stress in the webbing.	
13	2672	C	The superheater vents should always be open when _____.	blowing down the boiler	using the steam soot blowers	lighting off or securing the boiler	the water level is lower than normal	

13	2681	D	Which of the following statements defines the term 'axial float' in reference to reduction gears?	The gears are not subject to excessive tooth loads due to mismatching of the journal bearing halves.	The gears are double-helical and axial thrust is eliminated.	The gears are capable of free motion, neither supporting nor being supported radially by other gears.	The gears are capable of free motion, neither supporting nor being supported axially by other gears.	
13	2682	B	The scavenging air for soot blowers is supplied by the _____.	low pressure air compressor	forced draft blowers	control air regulator	all of the above	
13	2691	B	Which of the following represents one of the designed functions of reduction gears?	Change rotary motion into linear motion.	Combine multiple speed inputs into a single low speed output.	To amplify low speed to high speed.	Utilize a single engine input and convert to multiple propeller output.	
13	2701	D	When securing the main engine, which of the listed procedures should be carried out to remove or reduce condensation from the interior of the main reduction gear casing?	Circulate oil until oil and gear casing have reached ambient temperatures.	Continue to operate the lube oil purifier until there is no water discharge.	Continue to operate the lube oil cooler and rotate the engine with the turning gear.	All of the above.	
13	2711	D	In a gravity lube oil system, a sight glass is installed in a line near the operating platform. This line connects the _____.	bottom of the gravity tank and the lube oil headers	bottom of the gravity tank and the sump	gravity tank overflow and the lube oil headers	gravity tank overflow and the sump	
13	2721	C	A Kingsbury, or pivot shoe type thrust bearing, can bear much greater loads per square inch of working surface than can parallel surface bearings because provisions are made in the Kingsbury bearing _____.	for adjusting the filler piece thickness behind the pivotal-shoes to give a more accurate fit	for automatically adjusting clearances to the correct value when wear occurs	for the shoes to tilt slightly, thereby allowing the formation of a wedge shaped oil film under a thrust load	to allow the leveling plates to pivot on the collar when thrust loads are applied	
13	2731	D	If saltwater leaks into and contaminates the main lubricating oil system, which of the following remedial actions should be taken?	Locate the leak and seal it off when time permits.	Disengage the jacking gear and allow contaminated oil to cool to engine room temperature.	Secure the engines and prevent the circulation of contaminated oil.	Seal off the leak and promptly remove all contaminated oil from steel parts and surfaces.	
13	2741	D	Which of the following statements represents the principle of operation of the Kingsbury type thrust bearing?	A flat film of oil is more readily formed and maintained than a wedge shaped oil film.	A flat film of oil can carry heavier loads than a wedge shaped oil film.	A wedge shaped film of oil absorbs less heat than a flat oil film.	A wedge shaped film of oil is more readily formed and maintained than a flat oil film.	

13	2751	B	Which of the following statements represents the function of the center groove machined on a double-helical gear?	It allows the gears slight axial movement without gear damage.	It allows a path for oil to escape regardless of the direction of rotation.	It prevents excessive axial thrust loads from developing on the teeth.	It is used to distribute oil to the gear teeth.	
13	2752	B	As the rate of combustion is increased in a boiler, more steam is generated because the _____.	fires are hotter	weight rate of hot gas flow increases	furnace becomes hotter	flue gas turbulence decreases	
13	2761	A	By which of the following means can rotating parts of the main reduction gear be examined?	Inspection covers	Bull's eyes or sight glasses	RT junction boxes	Tachometer drives	
13	2762	D	When raising steam on a boiler, the superheater drains should _____.	be opened to remove condensate, and then closed when the first burner is lit	be closed until just before line pressure is reached, and then given a short blow period	be closed until after the air cock is closed, and then opened until the boiler is placed on line	remain open or partially open until steam blows through the lines, and then the valves should be closed	
13	2771	C	The maintenance of reduction gear units is principally concerned with attention to keeping the _____.	reduction ratio constant between the speed of the turbine and the speed of the driven element	upper half of the gear casing secured to the lower half	gears supplied with clean oil at the proper operating pressure and temperature	drive gears aligned with drive shaft	
13	2772	D	After steam has been raised and a boiler is being placed on the line, the superheater vent can be closed when _____.	main and auxiliary steam line drains are opened	the boiler steam stops have been warmed up	boiler pressure is 5 psi above line pressure	the boiler is supplying auxiliary steam	
13	2781	C	Which immediate action should you take when the temperature of one line shaft bearing increases above its normal operating temperature?	Stop the unit and carefully inspect the bearing.	Stop the unit and replace the bearing.	Check the bearing for proper lubrication.	Check for proper water circulation to the lube oil coolers.	
13	2782	C	When a boiler is up to pressure and is being placed on the line, you should secure the _____.	air cock	economizer drain	superheater vent	air heater vent	
13	2791	D	Which of the following problems is likely to occur if the lube oil level in the sump is too high?	Aeration of the oil.	A rise in oil temperature.	The main engine could not be operated at full speed.	All of the above.	
13	2792	D	Which of the listed conditions can cause excessively high superheater outlet steam temperature in an automated boiler?	High water level in the steam drum.	Excessive heat transfer in the control desuperheater.	Insufficient excess air.	A malfunction of the windbox airflow transmitter.	
13	2801	B	Sludge tanks are used in an oil lubricating system to receive _____.	makeup oil that is to be added to the system after settling	foreign liquid matter, discharged from the lube oil purifier or the stripping pump	bilge slops that can be reclaimed after clarification	all of the oil that passes through the lube oil coolers	

13	2802	A	On a boiler equipped with an uncontrolled interdeck superheater, reducing the feedwater temperature to the steam drum will cause the superheater outlet temperature to _____.	rise	decrease	rise momentarily then decrease	remain constant	
13	2811	C	Dirt and/or metallic particles in a reduction gear lubricating oil system may cause which of the following problems to occur?	Uniform polishing of the journals.	Clogging of the spray nozzles.	Spalling of the gear teeth.	All of the above.	
13	2841	D	In herringbone helical gear sets, the tooth contact loading _____.	is both a sliding and rolling action	is distributed over several teeth simultaneously	is distributed between two opposing helices	all of the above	
13	2851	D	A cloudy or milky appearing lube oil sample, taken from the main lubricating oil system could be caused by _____.	insufficient cooling water to the lube oil cooler	excessive cooling water to the lube oil cooler	insufficient gland sealing steam	excessive gland sealing steam	
13	2861	B	Reduction gears on main propulsion turbines are double helical cut to _____.	reduce torque	eliminate gear tooth thrust	increase pinion deflection	reduce the size and weight of the bull gear	
13	2862	D	The steam generating capacity of a boiler depends upon the _____.	number of burners	relative size of tubes and downcomers	amount of heat absorbing surface	all of the above	
13	2871	D	In a disk type lubricating oil centrifuge _____.	the centrifuge driving gears are lubricated by the reclaimed oil as it leaves the bowl	all dirt and sludge are discharged with the cooling water	sealing water must never be supplied until after oil is fed to the unit	deterioration of the bowl ring gasket will cause the purifier to lose its water seal	
13	2872	A	Under otherwise normal steaming conditions, an abnormally high temperature at the superheater outlet of a single furnace boiler would indicate _____.	poor heat transfer in feedwater heaters	high steam demand	insufficient combustion air	excessive steam supply to fuel oil heaters	
13	2881	A	Main reduction and pinion gears are double helically cut to _____.	reduce end thrust and noise	decrease reduction gear radial bearing loads	increase tooth deflection at high speeds	decrease the number of teeth in contact	
13	2882	B	When answering a full astern bell from half ahead, the superheater outlet temperature on a single furnace boiler will _____.	increase sharply with the increased firing rate	decrease due to the increase steam volume used	decrease momentarily and then increase proportionately with load demand	remain the same	
13	2892	B	The purpose of the pressure control disk installed in the multi-nozzle soot blower, as shown in the illustration, is to _____.	control the pressure exerted on the steam valve disk when the cam secures the steam supply	reduce the steam supply pressure to the proper soot blower operating pressure	control the pressure exerted on the valve spring retainer	increase the pressure in the steam supply line for proper soot blower operation	

13	2901	D	Most main reduction gear units employ double helical cut gears, rather than single helical cut gears, because double helical cut gears _____.	eliminate the need for a turbine dummy piston	eliminate the need for spherically seated bearings	prevent unequal tooth contact	prevent end thrust	
13	2911	B	Lube oil temperature leaving the lube oil coolers is regulated by throttling the _____.	cooling water inlet valve	cooling water outlet valve	lube oil return flow valve	lube oil outlet valve	
13	2912	C	In an automatically fired boiler, increasing the temperature of the feedwater entering the steam drum will ultimately result in a/an _____.	increase in the quality of superheated steam	increase in fuel consumption	decrease in the degree of superheat	decrease in the quality of steam entering the superheater	
13	2921	B	The purpose of the main reduction gears is to _____.	transmit vibration and thrust to the ship's hull	reduce high turbine RPM to an efficient propeller RPM	reduce engine room noise levels during high speed operations	provide a means of reversing the main engines in an emergency	
13	2931	D	If a tube should leak in an operating main steam turbine lube oil cooler, the water will not immediately contaminate the oil because the _____.	second-stage discharge valve will open	plug type bypass valve will open	cooling pump would automatically shut off	oil pressure is greater than the water pressure	
13	2941	B	An air vent is installed on some reduction gear casings to _____.	avoid the accumulation of flammable oil vapors	release air pressure buildup	admit cooling air to the gearing	decrease the possibility of corrosion	
13	2951	D	During high speed operation of the main turbine propulsion unit, the heat absorbed by the lubricating oil is removed by the _____.	lube oil purifier	sump vents	distillate cooler	lube oil cooler	
13	2961	D	Which of the following bearings is designed to take loads applied to the axis of the shaft?	Radial	Spring	Strut	Thrust	
13	2971	A	In some lube oil systems, the temperature of the lube oil downstream from the lube oil cooler is directly regulated by _____.	a thermostatically controlled valve which bypasses oil around the cooler	the amount of latent heat that the oil carries away from the bearings	the ambient sea water temperature	The operating speed range of the equipment	
13	2981	C	When the temperature of the main steam turbine lubricating oil is lowered, an increase will occur in the _____.	pour point	concentration of contaminants	viscosity	flash point	
13	2991	B	Thrust bearings are installed in main propulsion turbines to _____.	cancel centrifugal thrust force	control rotor axial movement	eliminate the need for dummy piston	maintain radial clearances	

13	3001	C	To test an automatic low lube oil pressure trip on an idling turbogenerator and at the same time prevent the chance of bearing damage, you should _____.	actuate the overspeed trip, making a note at what pressure the oil is dumped from under the operating piston	close the generator steam throttle valve and then ensure a supply of oil through the hand or standby pump when the pressure drops to 5-6 psi	secure the steam supply valve to the throttle valve and then observe the oil pressure as the throttle trips during the slowdown and ensure a supply of oil through the hand or standby pump when the pressure drops to 2-3 psi	ensure the standby lube oil pump, if so equipped, is properly lined up and set in the 'auto' mode, or the hand pump is being operated and then actuate the emergency trip	
13	3002	C	In a steadily steaming boiler, carryover is indicated by a/an _____.	inability to maintain boiler chemistry	sudden increase in superheater outlet temperature	sudden decrease in superheater outlet temperature	sudden decrease in drum level	
13	3011	A	Which of the following methods provides for axial movement in a gear type flexible coupling?	External teeth on the floating member are allowed to slide between internal teeth on the shaft ring.	Each gear is allowed to slide on its shaft between retaining collars.	A coupling permits free relative radial motion of the gear and pinion, thereby allowing axial movement.	Opposing helices act to balance axial thrust with the coupling.	
13	3012	B	The plugging of an excessive number of superheater tubes will result in _____.	high superheater outlet temperature	low superheater outlet temperature	high boiler water level	low superheater outlet pressure	
13	3021	B	After a prolonged shutdown of a main propulsion turbine, and before the turning gear is operated, the lube oil temperature should be at least _____.	60°F	90°F	110°F	120°F	
13	3022	A	A rapid fluctuation of the superheater outlet temperature on a steady steaming boiler could indicate _____.	water carryover into the superheater	excessive steam flow through the superheater	leaks in the superheater element	failure of the internal auxiliary desuperheater	
13	3031	A	What is the significance of pinion deflection in the operation of reduction gears?	Pinion deflection causes unequal tooth loading.	Deflection is minimal because the pinion is rigid.	Deflection increases the load at the center of the pinion.	Deflection decreases the load at the ends of the pinion.	
13	3032	A	At a given pressure, erosion of steam piping and machinery will be minimized by utilizing _____.	superheated steam	desuperheated vapor	wet steam	saturated steam	
13	3042	A	A heavy accumulation of soot on the fireside of the superheater can cause a _____.	low superheater outlet temperature because of the insulating effect of soot	high superheater outlet temperature because of reduced steam flow	high superheater inlet temperature because of decreased heat transfer	high superheater outlet temperature because of gas laning	
13	3051	D	Why is a high lube oil level in the main engine reduction gear sump undesirable?	Oil churning may result.	The oil may become aerated.	Oil temperature may rise.	All of the above.	

13	3061	D	Which of the listed operational checks should be continuously made on the main propulsion reduction gears?	Check radial bearing wear.	Inspect alignment between gears and turbine.	Check teeth for pitting and scuffing.	Check lube oil bearing temperatures.	
13	3071	C	After the housing has been bolted down, the final check of reduction gear tooth contact is usually made by _____.	alignment gauges	dial indicators	bluing the teeth	bridge gauges	
13	3072	A	Boiler superheaters are designed to _____.	raise the sensible heat of the steam	increase the overall mechanical efficiency of the plant	provide continuous steam flow to the control desuperheater	raise the latent heat of the steam	
13	3081	D	Excessive thrust bearing wear in a main propulsion turbine should FIRST become apparent by _____.	rubbing noises when jacking over the main unit	metal particles in the lube oil purifier	an intermittent vibration when changing speed	taking rotor position indicator readings	
13	3082	B	Increasing the amount of excess air to a boiler equipped with an uncontrolled interdeck superheater will cause the steam temperature at the superheater outlet to _____.	decrease	increase	decrease momentarily	increase momentarily	
13	3091	A	Oil flowing through the sight glass in the line between the lube oil gravity tank and main sump indicates the _____.	gravity tank is overflowing	lube oil pump is stopped	lube oil suction strainer is clogged	lube oil sump is full	
13	3101	D	Gear surface failure caused by exceeding the endurance limit of the surface material is characterized by _____.	initial or corrective pitting	destructive pitting	spalling	All of the above are correct.	
13	3102	A	An excessively high superheater temperature could be the result of _____.	excessive air	high feedwater temperature	soot accumulation on the superheater	excessive steam demand	
13	3111	B	Which of the following conditions is indicated by the oil flowing through a lube oil gravity tank bull's eye?	Excessive oil is stored in the gravity tank.	Sufficient oil flow is being supplied to the gravity tank.	Insufficient oil is being pumped to the gravity tank.	Turbine bearing failure has occurred.	
13	3112	C	If a pressure drop does not exist across the superheater in a steaming boiler _____.	this is a normal condition	the drum safety valve is about to lift ahead of the superheater safety	there is no steam flow through the superheater	the feedwater temperature is too low	
13	3121	C	If a spring bearing begins to run at an abnormally high temperature, you should _____.	increase the water flow to the main lube oil cooler	immediately stop the shaft to prevent seizing	slow the shaft, if possible and supply emergency cooling water to the spring bearing housing	alternate the shaft speed to flush out the bearing	
13	3122	C	Superheaters of the convection type are heated _____.	by direct contact with the flame	by hot brick work	by gases passing over them	from the fuel bed	
13	3131	C	You would not see a flow through the bull's-eye of the lube oil gravity tank overflow line when the _____.	main engines are stationary at a stop bell	main engines are secured and the turning gear is engaged	the lube oil service pumps are secured	main engines are turning at normal sea speed	

13	3132	D	Under operating conditions of constant load and rate of combustion, which of the following conditions will happen to the superheater when the amount of excess air to the furnace is increased?	The superheater outlet temperature decreases.	The rate of heat transfer is decreased.	The rate of steam flow is increased regardless of all other firing conditions.	The superheater outlet temperature increases.	
13	3141	C	The base ring shown in the illustration is identified by the letter _____.	A	C	D	E	SE-0012
13	3142	D	The temperature of steam at the superheater outlet is effected by the _____.	temperature of the feed water	amount of excess air	amount of moisture contained in the steam	all of the above	
13	3151	C	The lube oil cooler will be used as a heater for the main propulsion unit _____.	when the vessel is operating at full speed	if the oil temperature is below 120°F	when warming up a cold plant	when lube oils of different viscosities are used	
13	3152	D	Which statement is true concerning operational factors affecting the degree of superheat in a single furnace boiler?	As the rate of combustion increases, the degree of superheat increases throughout the entire firing range.	With a constant firing rate and steam consumption equal to generation, a decrease in the incoming feedwater temperature results in a superheat temperature decrease.	With large amounts of excess air, superheater outlet temperature will decrease due to the lack of sufficient time for heat transfer to take place.	Carrying boiler water total dissolved solids higher than normal could result in a decrease in the degree of superheat.	
13	3161	A	In the diagrammatic arrangement of the thrust bearing, shown in the illustration, the direction of shaft rotation and the direction of thrust are indicated respectively by arrows _____.	F and J	F and H	G and J	G and H	SE-0012
13	3162	A	Rapid fluctuation in the superheater temperature of a steady steaming boiler indicates _____.	moisture carryover	improper positioning of superheater fires	leaky desuperheater tubes	leaky superheater tubes	
13	3171	C	The reduction gear shown in the illustration is a/an _____.	nested double reduction gear	nested four-step reduction gear	articulated double reduction gear	locked-train double reduction gear	SE-0013
13	3172	B	Rapid fluctuation of the superheater outlet temperature is caused by _____.	a dirty economizer	intermittent carryover	excess air	dirty watersides	
13	3181	B	The purpose of oil deflector rings for turbine shafts include _____.	directing the lube oil spray	preventing oil leakage along the shaft	forming the lube oil spray pattern	removing emulsified lube oil from the sump	
13	3182	B	The primary purpose of the refractory in a marine boiler is to _____.	conduct the heat of combustion away from the water wall tubes	protect the furnace casing and retain furnace heat	support the outer casing	protect the superheater from convectional heat transfer	

13	3191	B	Which type of reduction gear arrangement is shown in the illustration?	Locked train, double reduction.	Articulated, double reduction.	Nested, double reduction.	Two-pinion, single reduction.	SE-0013
13	3192	B	The purpose of the refractory lining of a water-tube boiler furnace is to _____.	prevent flames from impinging on tubes	assist in maintaining the heat of combustion within the furnace	support the outer casing	protect the superheater from convectional heat transfer	
13	3201	A	The component shown in the illustration, labeled "I", is the _____.	first reduction gear	first reduction pinion	second reduction gear	second reduction pinion	SE-0013
13	3202	B	A secondary function of the refractory installed in a marine boiler is to _____.	support the boiler casing	direct the flow of combustion gases	maintain air flow through the burner diffuser	support the burner distance piece	
13	3211	D	The gravity tank in a gravity lube oil system serves to _____.	store heated lube oil	supply the lube oil service pump with a positive suction head	settle lube oil prior to purifying	maintain oil supply for several minutes to bearings should the lube oil service pump fail	
13	3212	D	Which of the problems listed will reduce boiler efficiency?	Using worn sprayer plates.	Steaming with a clear stack.	Tolerating unacceptable levels of carbon monoxide in flue gas.	All of the above.	
13	3221	A	The disassembled thrust bearing, shown in the illustration, which of the listed parts is labeled "I"?	Base ring.	Leveling plates.	Thrust shoes.	Collar.	SE-0014
13	3222	C	As compared with a typical front fired boiler, which of the listed conditions represents an advantage of a top fired boiler?	No division tube wall separating the convection and radiant sections of the furnace is ever required.	Superheating diaphragms may be omitted.	More uniform heat distribution and gas dwell is obtained within the furnace.	A lower fuel flow rate can be allowed, thus increasing economy.	
13	3231	B	On a ship equipped with a gravity type lube oil system, which of the conditions listed will occur FIRST if the main lube oil pump discharge pressure is lost?	All bearing oil pressure will be lost.	An alarm will sound.	The astern throttle will immediately open.	Lube oil will be provided to the bearings and gears via the gravity tank overflow line.	
13	3232	D	Which of the listed absorbing agents could be used in a boiler during a dry lay up period?	Sodium hydroxide	Sodium chloride	Deactivated alumina	Silica gel	

13	3241	A	Which of the following statements is true concerning the turning gear rotor arrangement shown in the illustration?	The second reduction worm gear always rotates whenever the turning gear motor is in operation; regardless of the position of the engaging handle.	The turning gear motor coupling is engaged by the locking device.	In order for the 'turning gear engaged' indicating lamp to be lit, the switch must be of the normally closed type.	The first reduction gear meshes directly with the bull gear.	SE-0015
13	3242	B	A water-tube boiler can be laid up either wet or dry. If it is to be laid up wet, you should _____.	completely fill the boiler with water, then blowdown to steaming level	completely fill the boiler with deaerated feedwater and maintain a slight pressure	drain and refill the boiler each week	drain and refill the boiler when the pH goes above 6	
13	3251	B	Which of the following conditions is the engineer's FIRST warning that the main lube oil pump has stopped?	Gravity tank low level alarm will sound.	Lack of oil in the overflow bull's-eye is observed.	High main engine bearing temperatures will be noted.	Low main sump level alarm will sound.	
13	3252	A	When a propulsion boiler is removed from service for an extended period, why should the firesides be thoroughly cleaned and dried?	Reduce the probability of corrosion.	Prevent flarebacks on lighting off.	Prevent cracking of the brickwork.	Reduce the possibility of thermal spalling.	
13	3261	D	Because the entire thrust bearing assembly is normally submerged in oil, the pivoting shoe arrangement allows the formation of a continuous wedge shaped oil film shown in the illustration by arrow "B", between the _____.	leveling plates and collar	base ring and pivoted shoes	leveling plates and buttons	collar and pivoted shoes	SE-0012
13	3262	A	Which of the listed actions should be carried out if a ship is to be laid up for an indefinite period of time?	Boilers to be laid up wet should be completely filled.	All fuel tanks should be cleaned and gas freed.	All potable water tanks should be cleaned and disinfected.	All of the above.	
13	3272	A	When you are installing a new furnace floor in an oil fired boiler, the clearance between the firebricks should be large enough to _____.	allow for expansion without subjecting the joint to flame penetration	facilitate rebricking at required maintenance intervals	allow for proper filling with slag under normal operating conditions	allow for installation of plastic chrome ore after drying	
13	3281	A	Supply pressure to the main lube oil header of a gravity feed lube oil system is _____.	the result of the height of the gravity tank above the manifold	the sum of the lube oil static head pressure and service pump discharge pressure	the difference between the lube oil static head pressure and service pump discharge pressure	merely the service pump discharge pressure, since the static heads of the lines to and from the gravity tank cancel out one another	

13	3282	D	To assure a long service life for boiler refractory materials after installation, the most effective method is to _____.	maintain a high furnace temperature at all times	patch refractory with plastic chrome ore	properly secure refractory with anchor bolts	avoid rapid temperature changes and follow recommended operating procedures	
13	3291	B	Magnets located in lube oil strainers serve to _____.	remove all metallic particles from the lube oil	remove ferrous metallic particles from the lube oil	remove nonferrous metallic particles from the lube oil	hold the strainer cover in place when removing or installing the cover bolts	
13	3292	C	Which of the listed procedures is the most important factor to take into consideration when making repairs to the refractory surrounding the burner openings?	All cracks must be completely filled.	Finished repair surfaces must be smooth.	Design refractory cone angle must be maintained.	Plastic firebrick must be used.	
13	3301	C	In the thrust bearing assembly illustrated the total oil clearance can be correctly decreased by _____.	increasing the thickness of the adjusting ring	increasing the thickness of the filler piece	decreasing the thickness of the adjusting ring	decreasing the thickness of the filler piece	SE-0007
13	3302	B	A furnace wall in which there are open spaces around the brick as a result of firebrick shrinkage, is _____.	normal and need only be cleaned	loose and should be repaired	cracked and must be patched	spalled and must be replaced	
13	3311	B	In a pressure type main propulsion turbine lubrication system, the lube oil service pumps normally take suction from the main sump and discharge directly to the _____.	gravity feed tank	lube oil coolers	lube oil header	main thrust bearing	
13	3312	C	When drying and baking are impractical, or time is not available, which of the listed materials could be used to repair both burner openings and gas baffles?	Plastic chrome ore	Plastic fire clay	High temperature castable refractory	Baffle mix	
13	3321	D	Water can enter the lube oil system of a main propulsion turbine unit from _____.	leaky tubes in secured lube oil coolers	steam sealed turbine glands	vents on tanks and gear casings	all of the above	
13	3322	A	When cleaning the waterside of boiler tubes with a powered rotary brush, the brush should kept in motion to _____.	avoid tube damage	prevent it from seizing	reduce tube pitting	reduce wear to brush bristles	
13	3331	C	The temperature of emulsified lubricating oil entering a purifier from a preheater should range between _____.	110°-120°F	140°-150°F	160°-180°F	190°-210°F	
13	3332	D	Maximum heat transfer rates in a marine boiler can be obtained by _____.	maintaining the recommended boiler water pH	treating the boiler water with oxygen scavenging chemicals	maintaining the feedwater temperature of 212°F	keeping the watersides free from scale deposits	

13	3341	A	Water retained in the lube oil system of a main propulsion turbine installation is undesireable because it _____.	causes pitting of the gear teeth	causes the turbine to overspeed	raises the flash point of the oil to a dangerously high level	results in excessive cooling of bearing surfaces	
13	3342	B	The correct method of expanding a generating tube at the boiler drum tube sheet is to roll _____.	to a depth less than the thickness of the drum tube sheet	to a depth greater than the thickness of the drum tube sheet	heavily at the tube end prior to welding the tube to the drum tube sheet	slightly at the tube end prior to welding the tube to the drum tube sheet	
13	3351	A	If the main and standby lube oil service pumps of the main engine fail while underway at sea, _____.	an emergency supply of oil in the gravity tank will provide time to crash stop the turbine and gears	the reduction gear bearings will immediately fail	the turbine bearings will immediately fail	emergency lubrication can be supplied through the use of the hand pump	
13	3352	D	Which of the listed conditions is the cause of heavy flaking of an alloy tube being rolled or expanded into a tube header?	Tube is brittle as a result of long storage time at high temperatures.	Tube has a flaw at the point of tube sheet entry.	Diameter of the tube roller is too large.	Excessive tube roller pressure is being applied.	
13	3361	D	If lube oil pressure to the main turbines is lost while underway at sea speed, the rotor should be stopped immediately. This is accomplished by _____.	applying the pony brake	tightening the stern tube packing gland	securing all steam to the turbines	admitting astern steam to the turbines after securing ahead steam	
13	3371	A	What is the FIRST thing that will happen if both the main and standby lube oil pumps fail on a geared main propulsion turbine operating at full sea speed?	Ahead throttle will close.	Lube oil sump will overflow.	Vacuum will be lost.	HP turbine bearings will overheat.	
13	3372	C	The process of flaring the section of a boiler tube extending beyond the tube sheet into the drum is known as _____.	safe ending	expanding	belling	breeching	
13	3381	B	Which of the conditions listed could cause an oil flow sight glass, of a main turbine bearing, to be completely filled with oil?	An increase in oil temperature.	A restriction in the oil drain line to the sump.	Excessive air trapped in the lube oil system.	Oil being circulated at too cold a temperature.	
13	3382	A	Proper lagging of a single-element feedwater regulator is accomplished by applying the insulation material _____.	to the steam connection, but not water connection	to the water connection, but not steam connection	to both connections, including finned areas	only as necessary to prevent possible injury	
13	3391	A	Magnets are installed in the main propulsion turbine lube oil strainers to attract metal particles released through wearing of the _____.	reduction gears	turbine blades	bearing journals	turbine bearings	
13	3392	A	When testing boiler safeties, those valves not being tested are prevented from lifting by _____.	installing gags	securing the lifting arms	temporarily increasing the valve spring pressure	closing the actuating pilot valve	

13	3401	A	If the main turbine bearing lube oil pressure drops to 'zero' and cannot be restored immediately, you should _____.	notify bridge and crash stop the engine	reduce turbine rotor speed until lube oil sump level returns to normal	reduce turbine rotor speed and pump lube oil with the hand emergency pump	strike down makeup lube oil from the gravity tanks	
13	3402	D	To prevent safety valves from lifting when a boiler is being hydrostatically tested, you should _____.	tie down the hand lifting gear	increase the valve spring pressure	decrease the valve spring pressure	install gags on the valves	
13	3411	B	If you are underway at full speed on a vessel fitted with a main propulsion turbine pressure lubrication system, which of the following actions will be necessary upon complete loss of lube oil pressure?	Slow the main engines and strike down additional oil from the gravity tank.	First close the ahead throttle valve, then open the astern guardian valve, and then open the astern throttle to admit astern steam as quickly as possible.	Secure main steam to the turbines immediately and engage jacking gear.	Secure main steam to the turbines and break vacuum on the main plant immediately.	
13	3412	D	Which of the precautions listed should be taken when gagging a boiler safety valve?	Do not allow the gag to contact the safety valve stem.	Tighten the gag only with the special wrench supplied with the gag.	Ensure that all moving parts of the safety valve are free to move before installing the gag.	Tighten the gag only finger tight to prevent damage to the valve stem, disc or seat.	
13	3421	C	What immediate action should you take if you are on watch and note 'zero' lube oil pressure for the operating main turbine?	Immediately increase cooling water flow to lube oil cooler.	Slow the turbine to minimum speed and watch the bearing temperatures.	Stop the shafts.	Shift strainers and gravity tanks.	
13	3422	B	Safety valve gags should only be installed hand tight in order to prevent _____.	compression of the valve spring	bending of the valve stem	damage to the gag	overpressurizing the valve body	
13	3431	D	If a lube oil pump fails to build up discharge pressure, the cause could be the _____.	bypass valve is closed	discharge valve is open	suction vacuum is high	suction valve is closed	
13	3432	D	When using the universal color contrast-type dye penetrant to examine a boiler weldment, any surface defect will appear _____.	black against a white background	white against a black background	white against a dull red background	bright red against a white background	
13	3441	B	Abnormally low lube oil service pump pressure may be the result of _____.	a defective cooler bypass valve	excessively high lube oil temperature	wasted lube oil cooler zincs	all of the above	
13	3451	A	An excessive pressure differential across a lube oil strainer could indicate _____.	the strainer needs cleaning	the filter elements are installed upside down	the relief valve is stuck open	all of the above	
13	3452	B	When installing new safety valve escape piping, precautions should include assuring that _____.	bends or elbows in the line do not exist	no stress is transmitted to the valve	the quick-closing valve operates freely	the piping leads directly to the bilge	

13	3461	A	While a vessel is underway, which of the conditions listed would indicate a leak in the lube oil cooler?	Excessive lube oil consumption.	Excessive water discharge rate from the lube oil purifier.	Contamination of the lube oil.	Corrosion of the journals and bearings.	
13	3462	B	Which of the listed operating practices is considered as safe, and should be followed when opening and inspecting the waterside of a boiler?	Open the water drum manhole before opening the steam drum manhole.	Wire all valves closed that connect to other boilers.	Remove handhole plate dogs with a slugging wrench.	Ventilate the waterside until completely dry.	
13	3471	A	When a sudden increase in pressure occurs in a forced lubrication system, you should check for a _____.	loss of oil flow across one of the bearings	clogged lube oil pump suction	ruptured tube in the lube oil cooler	high lube oil sump level	
13	3472	A	Oil deposits can be removed from the waterside of boilers by 'boiling out' with a/an _____.	alkaline solution	acid solution	salt solution	kerosene solution	
13	3481	C	When there is a sudden increase of lubricating oil pump discharge pressure in a force feed lubricating system, you should FIRST check the _____.	pump relief valve	lubricating oil cooler outlet temperature	lubricating oil flow from the bearings	lubricating oil suction strainers	
13	3482	C	Which of the listed types of waterside deposits can normally be removed by boiling out a boiler?	Corrosion deposits	High temperature oxide	Oil	Sludge	
13	3491	B	A sudden increase in lube oil pressure to the main turbine would indicate _____.	a leak in the gravity tank	debris clogging the system	a leaking lube oil cooler	excessively cool lube oil	
13	3501	B	What should be done when foreign matter is found in a lube oil strainer?	Immediately stop the main engine and inspect all strainers.	Examine the foreign matter and determine its source.	Back flush the strainer to the lube oil sludge tank.	All of the above.	
13	3502	D	Which of the listed refractory materials should be used for patching a burner front formed of plastic, castable, or tile?	Plastic chrome insulation	Chrome castable insulation	Air-setting mortar	Plastic fireclay	
13	3511	C	Which of the following conditions may exist if you detect an excessive amount of metal particles on a main engine lube oil strainer magnet?	Journal bearing damage.	Turbine shrouding damage.	Reduction gear damage.	Main shaft bearing damage.	
13	3522	A	To make temporary emergency repairs to brickwork in a boiler furnace, which of the materials listed should be used?	Plastic refractory	Air setting mortar	Insulating block	Calcined diatomaceous earth	
13	3531	B	Which of the components listed is indicated by the "X" shown in the illustration?	Strainer	Sight glass	Drain	Branch line	SE-0010

13	3541	C	How is the lube oil temperature controlled in the pressurized lube oil system shown in the illustration?	Sea water flow through the cooler is adjusted by opening or closing the inlet valve.	A thermostatic valve diverts sea water flow around the cooler.	A thermostatic valve sensor determines temperature downstream of the L.O. coolers and the valve diverts lube oil flow through or around the cooler accordingly.	Lube oil flow through the cooler is adjusted by changing the speed of the lube oil pump.	SE-0011
13	3542	A	Tubes may be seal welded into fittings or headers of boilers and superheaters after they have been expanded and flared, provided the material in the fitting or header does not contain carbon in excess of _____.	0.35%	0.40%	0.45%	0.50%	
13	3552	B	In a single furnace boiler, fitted with a U-tube horizontal superheater, renewing the entire transverse support/seal plates usually involves _____.	removal of all screen tubes to gain access	removal of all superheater tubes to facilitate fitting	only replacing the dog-bone type supports that appear burnt	removal of all furnace refractory	
13	3561	D	Which of the following statements is true concerning the lube oil system shown in the illustration?	The gravity tanks supply emergency lube oil to the turbines and gears in the event of failure to the main, standby, and emergency lube oil pumps.	The battery-powered emergency lube oil pump supplies oil to the turbines and gears for four hours in the event of failure of the main and standby lube oil pumps.	The three-way temperature control valve bypasses cooling water around or through the lubricating oil cooler to maintain the desired oil supply temperature to the turbines.	The lube oil cooler, lube oil filters, and lube oil system pressure relief valves all drain to the lube oil sump tank.	SE-0011
13	3562	D	Routine maintenance of boiler sliding feet should include _____.	painting the sliding surfaces to prevent corrosion	removing all grease from around bolts	torquing retaining bolts on the stationary base	wire brushing to remove scale, rust, and dirt	
13	3572	C	To increase the blowdown of a nozzle reaction safety valve, _____.	lower the nozzle ring	raise the blowdown ring	lower the adjusting ring	raise the blowdown ring and then lower the nozzle ring	
13	3581	C	To assure the main propulsion turbine bearings are receiving the proper lube oil supply, you should check the _____.	bull's-eye in the gravity tank overflow	lube oil temperature at the cooler outlet	flow through the sight glass in the bearing	lube oil strainer magnets	

13	3582	A	Which of the test pressures listed is considered to be satisfactory when conducting a hydrostatic test on a desuperheater, which has undergone a welding repair, and has been reinstalled in a boiler having a MAWP of 900 psi?	250 psi	900 psi	1125 psi	1350 psi	
13	3591	B	The astern guarding valve must be open when a vessel is _____.	at full sea speed	maneuvering into port	running with a warm bearing	loading cargo	
13	3592	D	Increasing the blowdown of a boiler nozzle reaction safety valve is normally accomplished by _____.	increasing the valve spring compression	decreasing the valve spring compression	raising the adjusting ring	lowering the adjusting ring	
13	3601	D	While a vessel is underway, one of the FIRST indications of the failure of the gland leakoff exhaust fan motor is _____.	loss of vacuum at the turbine	increased turbine exhaust temperature	water knock in the turbine gland steam header	excessive steam leakage at the turbine glands	
13	3602	D	When installed, the economizer relief valve should always be set _____.	at the same pressure as the superheater safety valve	at the same pressure as the drum safety valve	50 pounds higher than the superheater safety valve plus the water pressure drop through the economizer	50 pounds higher than the drum safety valve plus the water pressure drop through the economizer	
13	3611	B	Some turbines used for high temperature and pressure service utilize special casing flange bolts having internal axial holes. The purpose for these cavities is to _____.	permit axial movement of the casing due to expansion	provide access for heating elements used to expand the bolts	act as a witness mark for properly tightening the nuts	provide access for a clamp dial indicator during tightening	
13	3612	D	Warping of superheater screen tubes can be caused by _____.	high superheater temperatures	high furnace temperatures	installing baffles of excessive length	sudden cooling of tubes after being overheated	
13	3621	C	Which of the coupling types listed is shown in the illustration?	Claw	Pin	Gear	Solid	SE-0001
13	3622	A	When you are installing a new furnace floor in an oil fired boiler, the clearance between each firebrick should be enough to _____.	allow for expansion without subjecting the joint to flame penetration	facilitate rebricking at required maintenance intervals	allow for proper filling with slag under normal operating conditions	allow for installation of plastic chrome ore after drying	
13	3631	D	Which of the following statements is true concerning the coupling shown in the illustration?	It allows for any misalignment between the main turbine and reduction gear.	It is commonly used between the first reduction pinion and the second reduction gear.	It is suitable for use on small auxiliary turbines only.	It can be used to connect the main turbine to the high-speed pinion.	SE-0001
13	3632	A	When you are installing a new furnace floor in an oil fired boiler, enough clearance should be left between firebrick to allow for _____.	expansion when the boiler is fired	flame penetration of the joint	proper filling of the joint with slag	ramming with plastic chrome ore	

13	3641	D	The part shown in the illustration would be located between which of the following components of a modern geared turbine main propulsion unit?	Between the bull gear and line shaft on the thrust bearing side of the gear.	Between the bull gear and line shaft on the side of the gear opposite the thrust bearing.	Between the first reduction gears and high-speed pinions of the high pressure and low pressure turbines.	Between the rotors and high-speed pinions of the high pressure and low pressure turbines.	SE-0001
13	3651	A	The type of turbine shown in the illustration is a _____.	velocity-compounded impulse turbine	pressure-compounded impulse turbine	pressure-compounded reaction turbine	combination impulse and reaction turbine	SE-0003
13	3652	A	The burner front refractory should be replaced when the slag accumulation causes _____.	the burner flame pattern to be distorted	slight radial cracking around the burner cones	the flame scanners to sense false signals from the glowing brickwork	overheating of the burner atomizer tips	
13	3661	B	The type of turbine shown in the illustration is classified as a _____.	pressure-compounded impulse	velocity-compounded impulse	pressure-velocity compounded impulse	pressure-compounded reaction	SE-0003
13	3662	B	When water washing the firesides of a boiler, which of the listed procedures should be followed?	Begin water washing while the brickwork is still warm.	Begin the washing above the economizer and work down.	Assure that the water stream impinges directly on the refractory to avoid tube damage.	Dry the boiler by firing all burners at high rates to evaporate moisture rapidly.	
13	3671	A	How many Curtis stages are contained in the turbine shown in the illustration?	1	2	3	none	SE-0003
13	3672	C	Which of the tools listed is used to remove a boiler tube from a header?	Swaging tool	Laminating tool	Backing out tool	Expanding tool	
13	3681	A	A ship is equipped with the illustrated turbine gear set and a right hand turning propeller. When steam is admitted to the astern element, with sternway on, the high-speed gear on the high pressure side is_____.	rotating the same direction as the low-speed pinion on the low pressure side as viewed from the aft end of the reduction gear.	turning clockwise as viewed from the forward end of the reduction gear.	turning opposite to the rotation of the high-speed gear on the low pressure side.	turning counter clockwise as viewed from the aft end of the reduction gear.	SE-0016
13	3682	C	Which of the statements represents an advantage of the 'bent tube' method of installing boiler tubes?	Removal and replacement of tubes is easier than with other methods.	Cleaning of tubes is easier than other methods.	A comparatively greater number of holes can be placed in a given area of the tube sheet.	A minimum number of spare tubes must be carried.	
13	3691	B	Which of the statements listed applies to the quill shaft shown in the illustration?	It has torsional rigidity to help maintain alignment between gear train elements.	It permits axial motion of the gear and pinion relative to each other.	It allows for flexibility and compensates for gross radial misalignment.	The single helix acts to balance end thrust and maintain gear position.	SE-0005

13	3692	A	Which of the listed mediums should be used when water washing a boiler?	Heated freshwater	Cold freshwater	Heated saltwater	Cold saltwater	
13	3701	A	How many pressure drops occur in the turbine stage shown in the illustration?	One	Two	Three	Four	SE-0003
13	3702	B	Which procedure should be followed to dry out the fireside of a boiler after water washing?	Place trays of silica gel in the furnace.	Alternate firing of one burner at a time for 15 minute intervals during a 5 hour period.	Open the furnace registers and run the forced draft fans for 3 hours.	Use a wire reinforced steam hose to put superheated steam in the furnace for 6 hours.	
13	3711	C	How is an excess of turbine gland seal steam remedied?	It exhausts to atmosphere.	It drains to the makeup feed tank.	It is directed to the gland exhaust condenser.	It is recirculated via the loop seal.	
13	3712	A	Improper water washing of the water-tube boiler firesides can cause _____.	sulfuric acid corrosion	decreased heat transfer capabilities	erosion of tubes and drums	loss of ductility in boiler tubes	
13	3721	B	Which of the listed conditions could occur if during start-up the rotor illustrated shifts radially?	The teeth in segments "A" could be sheared off as they rubbed against the sides of the machined rotor lands.	No appreciable damage would result as the segments "A" would simply move outward against spring compression.	Enough frictional heat would be produced, even in that short period of time, to cause distortion and ultimate scoring of the shaft.	None of the above as the operator would be fore warned of this situation through the action of the squealer ring "D".	SE-0006
13	3722	A	In the absence of the manufacturer's instructions, a good procedure in reassembling a high pressure boiler gage glass is to tighten the nuts in pairs and _____.	begin with the center bolts and work toward the ends	begin with the end bolts and work toward the center	start at the top and work down	start at the bottom and work up	
13	3731	B	An interference fit between the coupling bolts and coupling assembly shown in the illustration is produced by _____.	applying expansionary heat to the coupling hole surface, while at the same time contracting the bolt by chilling	using a hydraulic device to elongate the bolt, decreasing proportionately its diameter until the applied pressure is released	line boring accompanied with precision reaming until the bolt can be pneumatically driven into place without any abrasive damage resulting to the threads	line boring accompanied with precision reaming until the bolt can be hydraulically pressed into place without any abrasive damage resulting to the threads	SE-0008
13	3732	C	Which of the following actions, if any, should be taken if the water gage glass on a steaming boiler breaks?	Reduce the firing rate.	Close in on the feed stop-check valve.	Close the gage glass cutout valves.	No action is necessary since checks in the cutout valves automatically seat to stop loss of steam and water.	

13	3741	B	In order to reduce the oil clearance between the collar and the astern thrust element shown in the illustration, you would _____.	increase the thickness of the adjusting ring	decrease the thickness of the adjusting ring	increase the thickness of the filler piece	decrease the thickness of the filler piece	SE-0007
13	3742	A	A hole should be made in the sagged tube occurring in a water-tube boiler, prior to plugging the tube to prevent a _____.	pressure buildup in the tube	quick burnout of the tube	complete sagging failure of the tube	crack failure of the tube	
13	3751	D	After setting the allowable end play of the thrust bearing shown, you would establish the axial position of the turbine shaft by _____.	increasing the thickness of the adjusting ring	decreasing the thickness of the adjusting ring	changing the thickness of the thrust collar	changing the thickness of the filler piece	SE-0007
13	3752	B	If a water-tube boiler tube has sagged and must be plugged, a hole must be made in the tube wall to prevent _____.	quick burnout of that tube	pressure buildup in that tube	a complete sagging failure	tube cracking due to overheating	
13	3761	C	Helical gears are preferred over spur gears for reduction gear units due to they fact that they _____.	prevent torsional stress	eliminate pinion deflection	produce less noise and vibration	be easier to lubricate at high speeds	
13	3762	A	After a boiler generating tube has been plugged, _____.	a hole should be made in the defective tube	the firing rate should be reduced	the steam flow rate must be increased	all of the above	
13	3771	B	The purpose of a thrust bearing, mounted between the engine and the propeller of a steam plant power train, is to _____.	dampen torsional vibrations	transmit propeller thrust to the hull	maintain crankshaft radial alignment	absorb gear thrust in double helical gears	
13	3772	B	An obstruction in the top connection of a boiler gage glass will cause the _____.	water level to remain constant in the glass	water level to rise slowly in the glass	gage glass to overheat and break	gage glass to be blown empty	
13	3782	B	While the vessel is rolling in heavy seas, the level in the boiler gage glass remains steady, this is an indication that _____.	the gage glass is functioning normally	there is most likely an obstruction in the lower valve	the steam drum is adequately baffled	the water level in the steam drum is too low	
13	3792	A	Which of the following conditions is indicated by a bulged or bowed area of the boiler furnace wall _____.	brickwork has failed in that area	brickwork has become slagged	insulation block has become slagged	corbels have failed	
13	3802	D	Radial cracks have developed in the castable refractory of the burner cones after the first firing since the installation of new furnace front refractory. This is an indication of _____.	a need for plastic firebrick patchwork	inadequate cone angle	a need for castable refractory patchwork	relieved stresses	
13	3812	B	Coast Guard Regulations (46 CFR) require that in preparing a water-tube boiler for a hydrostatic test, you should fill the boiler with water at a temperature of not less than _____.	50°F and more than 100°F	70°F and more than 160°F	60°F and more than 120°F	100°F and more than 200°F	
13	3822	C	If the burner throat refractory does not fit tightly against the boiler inner casing, the casing plates can overheat and warp causing _____.	a combustion gas leakage through the outer casing	a combustion air leakage through the inner casing	the burner register doors to bind	the burner air cone to bind	

13	3832	C	Waterside grooving is usually very difficult to locate in a boiler tube before leakage occurs because _____.	detection and confirmation of this type of corrosion requires laboratory examination	it occurs only on the interior surfaces of desuperheater tubes	it usually occurs in the tube bends near the water drum	it occurs in narrow bands along the top of horizontal floor tubes exposed to the products of combustion	
13	3842	D	Which of the conditions listed could cause a boiler economizer to leak?	High feedwater temperatures.	Low feedwater pressure.	High stack gas temperatures.	Water hammer.	
13	3852	A	When a soot fire occurs, damage to an economizer can be minimized if you _____.	maintain feedwater flow through the economizer while extinguishing the fire	secure the economizer and open the drain valve to prevent steam pressure buildup	increase the forced draft fan speed to blow out the fire	secure the fires and inject CO2 into the furnace	
13	3862	C	Which of the conditions listed would indicate excessive soot buildup on the economizer?	High feedwater temperature entering the boiler	Low air temperature entering the boiler	High superheater temperature	Lower than usual air pressure in the furnace	
13	3872	C	Which of the problems listed will occur when the economizer temperature is below the acid dew point of the flue gases?	Hairline fractures	Efficiency loss	External corrosion	Hydrogen embrittlement	
13	3882	B	Which of the following would indicate a moderate leak in the desuperheater?	Higher than normal auxiliary steam pressure	Lower than normal auxiliary steam temperature	Higher than normal fuel oil consumption	Lower than normal fuel oil consumption	
13	3892	B	An indication of a moderate leak existing in a desuperheater is _____.	high auxiliary steam pressure	low auxiliary steam temperature	reduced feedwater consumption	sudden rise in superheater outlet pressure	
13	3902	D	A leak in a desuperheater could be indicated by an _____.	increased boiler water compound level in the boiler with the affected desuperheater	increased concentration of dissolved oxygen in boiler water	inability to maintain control of boiler water suspended solids	inability to maintain proper boiler water pH or phosphate levels	
13	3912	D	A small leak in the desuperheater of an operating boiler could cause an _____.	immediate increase in superheater outlet pressure	immediate decrease in superheater outlet temperature	immediate drop in boiler water level	inability to maintain required boiler water chemistry	
13	3922	A	A leak in the internal desuperheater located in one of the two main boilers on a ship can be indicated by a/an _____.	decrease in the amount of feed treatment chemicals remaining in that boiler	increase in the amount of feed treatment chemicals contained in that boiler	decrease in the amount of feed treatment required for proper water chemistry of that boiler	increase in the amount of time necessary for priming that boiler	
13	3932	B	Leakage into an internal desuperheater may be caused by _____.	steam scrubbers carrying away	external corrosion penetrating the desuperheater tube walls	chemical feed pipe leaking	excess lifting of safety valves	

13	3942	B	Which of the conditions listed could be the cause of chattering in a boiler safety valve?	Excessive spring tension.	Loose blowdown ring.	Excessive blowdown adjustment.	Scale in the escape piping.	
13	3952	A	While your vessel is underway at normal speed, a steam drum safety valve develops a significant leak. Your first corrective action should be to _____.	attempt to reseat the valve using the hand releasing gear	secure the boiler and check the valve spring compression	inspect the escape piping for binding on the valve body	secure the boiler and blank off the valve flange	
13	3962	A	The MOST common cause of heat blisters developing on boiler generating tubes is due to _____.	waterside deposits	flame impingement	gas laning	insufficient water circulation	
13	3972	D	Blisters developing on boiler tubes can be caused by _____.	air in the feedwater	cold feedwater	hot feedwater	waterside deposits	
13	3982	D	Heat blisters forming on the first row of the generating tubes are caused by _____.	fireside deposits	low water level	flame impingement	waterside deposits	
13	3992	A	If a large number of tubes has failed, you can minimize damage to a boiler by _____.	securing the fires, steam stops, and relieving boiler pressure	securing the fires, feed stops, and leaving the boiler cut on the line	increasing the feedwater supply to keep the boiler cool	speeding up the forced draft fans to blow steam up the stack	
13	4002	C	The boiler water level begins to fall very slowly due to the sudden failure of a water wall tube. In response to this situation, you should continue the feedwater supply and immediately _____.	reduce the firing rate of the boiler	secure the forced draft fans	secure the boiler	gag the drum safety valves to prevent loss of steam	
13	4012	C	If a large number of tubes fail in a steaming boiler, the _____.	steam pressure will rise rapidly	fires will always be extinguished	water level will drop rapidly	fires will hiss and sputter	
13	4022	D	Steam escaping from the boiler casing is a good indication of _____.	a leaking tube	a leaking water wall header	a leaking handhole gasket	all of the above are individually correct	
13	4032	B	What is the cause of 'laning' in a boiler tube bank?	Insufficient airflow	Excessive slag accumulation on the tubes	Low fuel oil pressure	Reduced furnace volume	
13	4042	B	Fireside burning of boiler tubes is usually the direct result of _____.	soot accumulations on a tube bank	overheating due to poor heat transfer	oxygen corrosion	slag accumulation on the firesides	
13	4052	D	Which of the following repairs should be made to a badly warped boiler tube?	Heat the tube and use a soft mallet to straighten it.	Use a hydraulic jack to cold bend the tube.	Assure that the warped tube does not touch adjacent tubes and then reroll it in the header.	Replace the tube with a spare, if available, or plug it.	
13	4062	D	Waterside abrasion of boiler tubes can be caused by _____.	entrained impurities in the boiler water	improper bends in the tubes	oxygen corrosion	mechanical tube cleaning	
13	4072	B	The development of pinhole leaks where the boiler tubes enter the water drums and headers, may be evidence of _____.	gas laning	soot corrosion	excess alkalinity	excess hydrazine	

13	4082	D	The generating tubes in an operating boiler will overheat and possibly fail when the boiler reaches the end point of _____.	evaporation	generation	combustion	circulation	
13	4092	D	Boiler tube failures can result from _____.	corrosion	overheating	mechanical stress	all of the above	
13	4102	D	Cratering and water tracking in boiler tubes is caused by _____.	burning a fuel with a high vanadium content	baked on slag deposits	soot corrosion	water trapped between tubes and refractory	
13	4112	C	If a tube failure results from low water level and the water level can not be maintained in sight in the gage glass, you should _____.	immediately secure the forced draft fans	increase the feed pump speed to maximum	immediately secure the fuel oil supply to the burners	blowdown the gage glass to verify a low water condition	
13	4122	A	Oil or scale deposits on boiler tube walls will cause _____.	those tubes to overheat	decreased boiler steam pressure	increased boiler steam pressure	an explosion in the boiler	
13	4132	D	Fireside burning of boiler tubes is usually the direct result of _____.	high furnace temperatures	gas laning in tube banks	oxygen corrosion of metallic surfaces	overheating due to poor heat transfer	
13	4152	D	Fireside burning of boiler superheater tubes is a direct result of _____.	combustion gases impinging on the tubes	fuel droplets striking the hot tubes	heating carbon steel tubes above 750°F	tubes becoming steam bound	
13	4162	D	Fireside burning of boiler tubes can be a result of _____.	slag deposit	improper atomization	soot accumulations	waterside deposits	
13	4172	C	The formation of a pit in the surface of a boiler tube is most likely to occur when _____.	waterside deposits are present	sludge is present	the tube metal acts as an anode	dissolved minerals are present	
13	4182	B	If a boiler tube bank baffle carries away, or burns through, there will be _____.	incomplete combustion	localized overheating of the water drum	excessive gas turbulence in the furnace	fireside burning of boiler tubes	
13	4192	D	If a steaming boiler begins 'panting,' the probable cause is _____.	too much air for proper combustion	excessively high furnace temperature	excessively cold fuel oil	insufficient air for proper combustion	
13	4202	D	Vibration or panting of a boiler can be caused by _____.	insufficient air	poor mixing of air and oil	excessive fuel oil temperature	all of the above	
13	4212	D	Pulsating boiler furnace fires can be caused by _____.	low fuel temperature	too much air	low fuel pressure	too little air	
13	4222	B	Panting or rumbling in a boiler furnace is usually caused by _____.	too much air	not enough air	low fuel temperature	low fuel pressure	
13	4232	C	If a boiler begins to pant and vibrate you should _____.	check the fuel oil service pumps	secure the fires	increase the air	reduce the steam demand	
13	4242	B	Which actions listed should be taken if a boiler is panting?	Decrease the air pressure to the burners.	Increase the air pressure to the burners.	Decrease the boiler water level.	Increase the boiler water level.	
13	4252	B	If a boiler is panting, which of the following actions should be taken?	Decrease the air pressure to the burners.	Increase the air pressure to the burners.	Increase the fuel oil pressure.	Increase the fuel oil temperature.	

13	4262	A	To avoid pulsations of the burner flame after rebuilding the boiler burner front tile refractory, _____.	the burner tile should be fitted to the throat ring rather than the surrounding brick work	the tile surface should be stippled with a wire brush	the tile surface should be coated with a thin layer of mortar	the vertical face of the tile should be perpendicular to the front casing	
13	4272	D	Panting in an oil fired marine boiler can be caused by _____.	excessive combustion air supply	low fuel oil temperature	fouled burner sprayer plates	insufficient combustion air supply	
13	4282	A	If a steaming boiler is not supplied with sufficient air for proper combustion, the _____.	boiler will pant and rumble	fires will hiss and sputter	boiler will smoke white	fires will be too hot	
13	4292	C	If a boiler fire is blown out by a flareback, you should immediately _____.	increase the forced draft blower speed	start the standby fuel oil pump	secure the fuel supply to the boiler burners	relight the fires with a torch	
13	4302	B	If a major flareback occurs to a boiler, which of the following actions should be immediately taken?	Secure the forced draft fan.	Secure the fuel to the burners.	Secure all fireroom ventilation.	Purge the fuel oil system.	
13	4312	B	When a boiler flareback occurs, you should _____.	reduce the forced draft blower speed	close the master fuel oil valve	take the boiler off the line	increase the fuel oil supply pressure	
13	4322	D	Gasket leakage around boiler handholes may be caused by _____.	improper positioning of the gasket	pitted seating surfaces	loose dogs	all of the above	
13	4332	D	If while filling the boiler a newly installed gasket on a water-tube handhole plate weeps, you should _____.	coat the gasket with graphite	retighten the stud nut with an air wrench	use a double gasket	center and tighten with correct size wrench	
13	4342	A	Which of the listed methods would be MOST effective when repairing a steam cut on a seating surface of a superheater handhole plate?	Filling the cut by welding and then grinding it smooth.	Filling the cut with iron cement or plastic steel.	Grinding the seating surface and installing an oversized gasket.	Refacing the surface and over torquing the handhole plate.	
13	4352	B	An indication of a faulty superheater soot blower element is a _____.	low stack temperature	low superheater outlet temperature	high superheater outlet temperature	low fuel oil consumption	
13	4362	C	If a soot blower element does not revolve freely, the most likely cause would be _____.	a seized blower head bearing	an improper blowing arc cam setting	warpage	insufficient steam pressure to the soot blower element	
13	4372	C	If an oil fire occurs in the double casing of a steaming boiler, you should _____.	increase the forced draft fan speed	secure the feedwater supply to the boiler	secure the fuel oil supply to the burners	apply water with a smooth bore nozzle	
13	4382	A	Excessive soot accumulations on boiler generating tube surfaces can result in _____.	high superheater outlet temperature	incomplete combustion in the furnace	reverse circulation of the steam and water mixture	low stack gas temperature	
13	4392	D	Boiler firesides must be kept free of soot accumulations because _____.	soot interferes with the flow of feedwater	the steam drum internals will become clogged	the fuel oil heaters will become overloaded	soot insulates the boiler heating surfaces	

13	4402	B	An indication of excessive soot accumulation on boiler water tubes and economizer surfaces is _____.	low stack temperature	high stack temperature	lower feedwater flow	high feedwater temperature	
13	4412	C	Which of the listed actions should be carried out with the superheater vent valve during the time steam is being raised in a boiler?	The valve must be wide open all the time until the boiler is on the line.	The valve may be closed when all air is vented.	The valve may be partially throttled as the pressure increases until the boiler is on the line at which time it is closed.	The valve need only be open if the superheater temperature approaches 850°F.	
13	4422	C	The terms 'swell' and 'shrink' relate to a change in boiler water level which _____.	results when the feed rate becomes erratic during maneuvering	is due to steam bubbles below the surface occupying a smaller volume	results from a change in steam flow or firing rate	indicates a high chloride concentration in the boiler water	
13	4432	B	The boiler wrapper sheet, shown in the illustration, is indicated by arrow _____.	A	B	H	I	SG-0007
13	4437	A	During initial starting of the standby turbine-driven feed pump, which of the listed valves should remain closed?	Pump discharge check valve	Turbine steam supply valve	Turbine exhaust valve	Pump suction valve	
13	4438	B	No lube oil appearing in the sight glass (bull's eye) of a gravity type system is a positive indication of _____.	no oil flowing to the bearings	no oil is overflowing the gravity tank	failure of all lube oil pumps	the gravity tanks being empty	
13	4442	C	The boiler superheater shown in the illustration is a/an _____.	horizontal U-type	overdeck convection-type	vertical U-type	overdeck integral-type	SG-0007
13	4452	A	Regarding the boiler shown in the illustration, the burners are to be placed at _____.	arrow "F"	arrow "K"	arrow "L"	none of the above	SG-0007
13	4462	D	The boiler shown in the illustration, arrow "O" indicates the _____.	main generating tubes	superheater tubes	screen tubes	soot blower elements	SG-0007
13	4472	A	The components lettered "O" shown in the illustration function to _____.	clean soot off the surrounding tubes	support the surrounding tubes	provide viewing of the generating tubes	acid clean the surrounding tubes during cold plant maintenance	SG-0007
13	4482	C	The component lettered "J" shown in the illustration serves as a _____.	water drum	support beam	side water wall header	screen tube header	SG-0007
13	4492	B	The boiler superheater vent, shown in the illustration, is connected to the part labeled '____'.	C	M	D	J	SG-0007
13	4502	C	The component labeled "F" as shown in the illustration is _____.	one of the retractable soot blower elements	a regenerative air heater	one of the main burner assemblies	a permanently installed Orsat apparatus	SG-0007
13	4512	B	Component "B" shown in the illustration is properly identified as the _____.	drumhead	wrapper sheet	tube sheet	drum crown	SG-0007

13	4522	D	The purpose of boiler tube curvature shown in the illustration in the area labeled "L" is to _____.	accommodate an oil burner for separately firing the superheater	compensate for the greater degree of expansion in the superheater area	accommodate an inspection port used to view superheater conditions while steaming	allow for access to the superheater cavity	SG-0007
13	4532	A	Which of the devices listed is indicated by arrow "H" shown in the illustration?	Economizer	Steam soot blowers	Overdeck superheater	Air heater	SG-0008
13	4542	C	The tubes projecting horizontally through the generating tube bank shown in the illustration are _____.	through stays	generator support tubes	soot blower elements	steam smothering lines	SG-0008
13	4552	C	Arrow "B" shown in the illustration indicates the _____.	regenerative air heater	retractable soot blower opening	combustion air inlet	uptakes	SG-0008
13	4562	D	The tube sheet shown in the illustration is indicated by the letter '____'.	A	B	I	K	SG-0008
13	4572	A	Where is the superheater located in the boiler shown in the illustration?	G	H	I	J	SG-0008
13	4582	D	Which of the devices listed is shown in the boiler illustration?	Retractable soot blower	Separately fired superheater	Regenerative air heater	Integral or interdeck superheater	SG-0008
13	4592	A	The boiler shown in the illustration has its screen tubes connecting the steam drum and the component label '____'.	I	G	F	D	SG-0008
13	4602	D	What type of boiler superheater is shown in the illustration?	Overdeck convection tube	Vertical U-tube	Overdeck integral tube	Horizontal U-tube	SG-0008
13	4612	D	In the boiler shown in the illustration, the arrow "E" indicates a _____.	water wall tube	recirculating tube	support tube	downcomer	SG-0008
13	4622	B	The screen tubes shown in the illustration are indicated by arrow '____.'	F	J	H	D	SG-0008
13	4632	D	The boiler screen tubes shown in the illustration connect the _____.	upper front header and water drum	upper front header and steam drum	lower front header and steam drum	steam drum and mud drum	SG-0008
13	4642	B	In the boiler shown in the illustration, the arrow "C" indicates a _____.	downtake nipple	water wall header	sliding foot	recirculating header	SG-0008
13	4692	B	A metal loss occurring in bands or stripes around the circumference of a tube is called a circumferential groove. When formed on the fireside of a tube, the cause is a result of _____.	burning of highly acidic bunker fuels	economizer leaking onto the rear of the generating tube bank	slag baking on the tubes	repeated flexing and vibration of the tubes	
13	5702	C	Why are two fuel oil heaters "E" provided in the fuel oil system shown in the illustration?	Each heater supplies fuel to a different boiler.	To allow fuel of different temperatures to be provided to be provided to each boiler.	To provide a backup in case one of the heaters becomes inoperable.	Two heaters are necessary when both boilers steam at full load.	SG-0009

13	5712	A	The fuel oil has been raised to the proper temperature for the straight mechanical atomization system of the boiler shown in the illustration, and is ready to light off. Which of the valves listed must be closed just prior to igniting the fuel?	J	G	A	H	SG-0009
13	5722	C	What type of boiler is shown in the illustration?	A downfired two furnace boiler with a vertical superheater, economizer, waterwalls and downcomers.	A Scotch boiler with a horizontal superheater, economizer, waterwalls and downcomers.	A two drum single furnace boiler with an interdeck superheater, an economizer, water walls and downcomers.	A sectional header boiler with a superheater, economizer, and water walls and downcomers.	SG-0008
13	5732	B	One function of the component labeled "C" shown in the illustration is to _____.	act as a foundation beam to support the weight of the boiler	provide a collecting area for sediment and sludge	cool the refractory	form a soot seal in the lower corner of the boiler casing	SG-0008
13	5742	D	The fittings labeled "P" shown in the illustration are known as the _____.	main steam stops	main steam outlets	desuperheater outlets	safety valve nozzles	SG-0011
13	5752	B	One function of the internal fitting labeled "C" shown in the illustration is to _____.	reduce high water level in an emergency	pass generated steam to the superheater	remove scum from the water surface	distribute feedwater throughout the drum	SG-0011
13	5772	A	Which of the listed types of safety valves is shown in the illustration?	Huddling chamber type	Jet flow type	Nozzle reaction type	Pressure-loaded type	SG-0018
13	5782	C	What is the function of valve "H" of the system shown in the illustration?	To regulate the amount of fuel burned.	To prevent fuel backflow from the manifold.	To provide for quick fuel shut off.	To recirculate fuel when lighting off.	SG-0009
13	5792	C	At which point of the blistered boiler tube shown in illustration will the temperature be the greatest?	A	B	C	D	SG-0012
13	5802	C	The device shown in the illustration is a/an _____.	air ejector	deaerator	desuperheater	eductor	SG-0013
13	5812	D	Which of the symbols shown in the illustration is used to identify a stop-check valve?	A	B	C	D	SG-0014
13	5822	B	Which of the problems listed could occur if the sliding-foot bearing surfaces, shown in the illustration, are not properly lubricated?	Deformation of the tank top.	Failure of pressure parts.	Corrosion of the pedestal.	Failure of main steam piping due to misalignment.	SG-0015
13	5832	B	In the system illustrated the valves at point "A" are _____.	swing check/ stop valves	stop-check/ stop valves	gauge valves/ drain valves	globe valves/ gate valves	SG-0005
13	5842	D	The popping pressure of the safety valve, shown in the illustration, is controlled by the _____.	seat bushing adjustment	feather guide retaining ring	adjusting ring position	amount of spring compression	SG-0018
13	5852	B	The boiler downcomers shown in the illustration are _____.	exposed to the radiant heat of the furnace	located away from furnace heat	installed directly adjacent to the superheater	supported by refractory	SG-0008

13	5862	D	Which of the following statements concerning the safety valve shown in the illustration is correct?	When the drop lever is raised, the safety valve spring is compressed.	When a gag is placed on the valve, it should be installed only finger tight to prevent damage to the spindle.	The adjusting ring should be firmly locked by the ring pin at all times except when blowdown is being adjusted.	All of the above.	SG-0018
13	5872	B	To adjust the amount of safety valve blowdown, as shown in the illustration, you would reposition the part indicated by arrow '_____.'	A	B	C	D	SG-0018
13	5873	A	When starting a turbogenerator in an automated plant, you must provide lube oil pressure to the unit by means of a/an _____.	auxiliary lube oil pump	line from the other generator	line from the gravity tank	line from the main lube oil pump	
13	5882	C	To change the lifting pressure of the safety valve shown in the illustration, you must readjust the part labeled _____.	A	B	C	D	SG-0018
13	5891	D	Boiler efficiency and its ability to absorb heat is limited by the need to _____.	maintain an excess of CO during transient firing rates	prevent excess air density at low load conditions	protect the safety valves from excessive temperature	maintain uptake gas temperature above the dew point	
13	5892	B	To readjust the blowdown of the safety valve shown in the illustration, you must change the position of the _____.	feather guide	adjusting ring	compression screw	huddling chamber	SG-0018
13	5902	D	To increase the popping pressure of the safety valve shown in the illustration, _____.	raise the adjusting ring	lower the adjusting ring	loosen the compression screw	tighten the compression screw	SG-0018
13	5912	C	On a boiler with a 775 MAWP, the drum safety valve shown in the illustration is set to lift at 650 psi and reseat at 630 psi. To increase the lifting pressure to 700 psi, but maintain the previous amount of blowdown, turn the compression screw _____.	in the clockwise direction only	in the counterclockwise direction only	clockwise and lower adjusting ring	counterclockwise and lower the adjusting ring	SG-0018
13	5922	B	When placing a gag on the safety valve shown in the illustration, it is necessary to remove the _____.	compression screw	cap	upper spring washer	all of the above	SG-0019
13	5932	B	The principal means of increasing the amount of blowdown for safety valve shown in the illustration, remove the set screw labeled _____.	"A" and raise the position of the ring	"A" and lower the position of the ring	"B" and raise the position of the ring	"B" and lower the position of the ring	SG-0019
13	5952	A	Which area shown in the illustration will offer the most resistance to heat transfer from the fireside to the waterside of a boiler tube?	B	C	D	E	SG-0017
13	5962	B	After patching refractory with plastic firebrick, holes are poked in the patch on 1 1/2 inch centers in order to _____.	prevent spalling	vent moisture	allow for expansion	prevent slag buildup	

13	5972	D	To prevent a small plastic refractory wall patch repair from falling into the furnace of a D-type boiler, you should _____.	attach anchor bolts to the furnace casing	reinforce the patch with fine mesh metal screen	mix the plastic with concrete prior to using	undercut the existing brick around the area to be patched	
13	5978	B	Circulation in a water-tube boiler is caused by the difference in the _____.	area and length of the water-tubes	densities of the circulating water	heights of the boiler drum	angle of inclination of the tubes	
13	5979	D	To stop the rotor of a main turbine while underway at sea you should _____.	apply the prony brake	tighten the stern tube packing gland	secure all steam to the turbine	admit astern steam to the turbine after securing the ahead steam	
13	5980	C	If an operating propulsion unit requires excessive quantities of gland sealing steam, you should suspect a _____.	vacuum leak in the condenser shell	flooded main condenser hotwell	worn or damaged labyrinth packing	restriction in the gland leak off piping	
13	5982	D	When water washing a boiler, the proper sequence for washing the sections should be the _____.	generating tubes, superheater, and then economizer	superheater, economizer, and then generating tubes	screen tubes, generating tubes, and then superheater	economizer, superheater, generating, and then screen tubes	