

Steam Plants I

ID #	Question	Choice A	Choice B	Choice C	Choice D
1	When the boiling temperature of a steam boiler is increased, which of the following effects will occur with relation to the pressure and the specific volume of the steam?	The steam pressure and specific volume will remain constant.	The steam pressure will increase and the specific volume will remain constant.	The steam pressure will remain constant and the specific volume will increase.	The steam pressure will increase and the specific volume will decrease.
2	46 CFR requires that _____.	the OCMI be notified of repairs to boilers and unfired pressure vessels	the fuel burned in boilers of tank ships 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
3	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
4	A basic comparison can be made between a low pressure evaporator operation and a main condenser with regards to the removal of non-condensable gases. The vacuum drag line for the main condenser is specifically connected in which area?	main tube bank	steam lane	air cooler section	hot well
5	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	blow down pressure of the boiler
6	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
7	A boiler economizer should be bypassed whenever the _____.	temperature of the stack gas is low enough to reach dew point	superheater outlet temperature is too high	DC heater outlet temperature is too high	main turbine is operating at half power
8	A boiler feed stop-check valve would be located at the _____.	boiler water drum	first stage feed water heater outlet	DC heater outlet	economizer inlet

ID #	Question	Choice A	Choice B	Choice C	Choice D
9	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 feed water regulator	at or near the engine room operating platform
10	A boiler fitting used to protect the superheater and to provide reduced temperature steam for use by auxiliaries is the _____.	reducing station	feed water injector	desuperheater	dry pipe
11	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
12	A boiler internal feed pipe is perforated to _____.	provide positive downward circulation at high loads	distribute the feed water throughout the steam drum	reduce back pressure in the feed water piping	reduce the overall weight of the drum internals
13	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
14	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
15	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
16	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)
17	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
18	A boiler water sample being collected for analysis should be circulated through a cooling coil because _____.	this keeps the water from flashing into steam as it is drawn from the higher pressure of the boiler into atmospheric conditions	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
19	A boiler with a water capacity of 10 tons, generates steam at the rate of 30 tons per hour. If the feed water concentration of solids was initially 0.5 PPM, and will increase at a rate of 1.5 ppm every hour, what would be the increase in the feed water concentration of solids after 24 hours?	12 ppm	24 ppm	36 ppm	48 ppm
20	A boiler with a water capacity of 10 tons, generates steam at the rate of 30 tons per hour. If the feed water 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
21	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
22	A cause of high superheater outlet temperature is _____,	high feed water temperature	low feed water temperature	excessive fuel oil temperature at the settlers	insufficient excess air
23	A check valve is located between the economizer and the steam drum to _____.	assure a positive feed water flow through the economizer	assure a positive feed water 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
24	A chemical based analysis of boiler stack gases is taken to _____.	determine the volume of the SO ₂ 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
25	A combustion control system diaphragm type air flow transmitter receives its high pressure signal from the boiler _____.	fan discharge	windbox	furnace	smoke box
26	A combustion control system, diaphragm-type, air volume regulator receives its low pressure signal from the boiler _____.	windbox	casing	furnace	smoke pipe
27	A common gas dissolved in water contributing to the greatest amount of corrosion in a condensate system is _____.	carbon dioxide	hydrogen	carbon monoxide	nitrogen
28	A condensate recirculating line is provided to the main condenser in a closed feed water 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

ID #	Question	Choice A	Choice B	Choice C	Choice D
29	A contaminated steam generator is used to produce saturated vapor from collected _____.	bilge water	sanitary water	fuel oil heating return drains	condenser cooling water
30	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
31	A convection type superheater in a D-type boiler is protected from radiant heat by _____.	generator tubes	convection currents	control desuperheaters	water screen tubes
32	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
33	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
34	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
35	A decrease in condenser vacuum is found to be caused by a loss of the air ejector loop seal. To reestablish the loop seal, you should _____.	crack open the recirculating line from the DC heater to the condenser hot well	close in on the recirculating line from the DC heater to the condenser hot well	bypass the regulating valve in the condensate recirculating line until the loop refills	close the condenser loop seal valve until the loop refills and reopen slowly
36	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
37	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
38	A flame scanner installed in modern boiler combustion control systems, functions to _____.	monitor the intensity of the burner flame	monitor the stack for soot fires	regulate burner fuel oil pressure	regulate the air flow to the furnace
39	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 economizer	I only	II only	Both I and II	Neither I nor II

ID #	Question	Choice A	Choice B	Choice C	Choice D
40	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
41	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
42	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
43	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
44	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
45	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
46	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
47	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
48	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
49	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
50	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
51	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
52	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
53	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
54	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
55	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
56	A lower than normal boiler stack gas temperature usually indicates _____.	dirty firesides	dirty watersides	fuel high sulfur content	incomplete combustion
57	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
58	A major difference between the two element and the three element feed water regulator control systems, is that a three element system will additionally measure and incorporate the _____.	drum water level to the feed water regulator	steam flow to the feed water regulator	feed water flow as sensed variable	fuel oil flow to the feed water regulator
59	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
60	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
61	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
62	A nozzle reaction safety valve will lift at a pressure lower than required if the _____.	adjusting ring is set too low	blow down is set too low	nozzle ring has come adrift	spring compression is insufficient
63	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
64	A pneumatic dual element, main propulsion, boiler feed water regulating system commonly used aboard ship utilizes _____.	two-position differential action	proportional action	proportional plus reset action	on off reset action
65	A practical consideration to allow for when operating a boiler at low load 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
66	A primary function of burner atomization steam is to _____.	maintain a constantly high fuel pressure	prevent overheating of the air register when secured	maintain a constantly high fuel temperature	impart a swirling motion in the oil spray for efficient combustion
67	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
68	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
69	A ruptured boiler tube should be removed by _____. I. splitting 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
70	A salinity indicator cell is located in the _____.	seawater side of the main condenser	main condenser hot well	evaporator brine suction line	low pressure turbine casing drain
71	A sample of boiler water can be chemically tested for alkalinity by initially adding a few drops of phenolphthalein and then slowly titrating the water sample until the _____.	sample color changes from clear to pink	sample color changes from pink to clear	water sample pH reaches 10.5	entire concentration of chlorides have been neutralized
72	A secondary function of atomization steam in a fuel oil burner is to _____.	maintain a constantly high fuel pressure	prevent overheating of the atomizer when not firing during maneuvering	maintain a constantly high fuel temperature	vary the viscosity of the fuel oil
73	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
74	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
75	A single element boiler feed water regulating system used aboard ship utilizes _____.	two position differential gap action	proportional action	proportional plus reset action	proportional plus reset plus rate action
76	A slight vacuum is maintained in the shell of the first stage 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 as supplied by the main engine LP bleed system	force the use of the main condenser as the drain cooler	avoid the necessity of having to use the condensate pumps
77	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
78	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
79	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
80	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
81	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
82	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
83	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
84	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
85	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 feed water temperature.
86	A sulfite test is conducted on boiler water to check for _____.	nitrates	sulfates	phosphates	excess oxygen scavenging agents
87	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
88	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
89	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.
90	A triple element, main propulsion, boiler feed water regulating system commonly used aboard ship utilizes _____.	two-position differential gap action	proportional action	proportional plus reset action	proportional plus reset plus rate action
91	A turbine-driven centrifugal feed pump used for boiler feed service should normally be stopped by _____.	hand activating the over speed 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
92	A two-element boiler feed water regulator is controlled by _____.	steam flow and feed water flow	steam flow and drum water level	drum water level and feed water flow	drum water level and drum pressure
93	A two-element feed water regulator not only responds to changes in water level, but is also designed to react to _____.	feed water flow	steam flow	fuel flow	steam pressure
94	A two-element feed water 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
95	A two-element feed water regulator responds directly to changes in _____.	feed water flow to the boiler	feed water pump discharge pressure	DC heater water level	steam flow from the boiler
96	A unit of measure used to express the chloride content of boiler water is _____.	PPM	Micro-Farads	pH	Micro-Ohms

ID #	Question	Choice A	Choice B	Choice C	Choice D
97	A vent line is provided on each water box of the main condenser in order to prevent _____.	insufficient head pressure being developed on the circulating pump discharge	inadequate heat transfer from developing during normal operation	Both A and B	Neither A nor B
98	A vent line is provided on each water box of the main condenser in order to prevent _____. I. insufficient head pressure being developed on the circulating pump discharge II. inadequate heat transfer from developing due to air bound tubes	I only	II only	Both I and II	Neither I nor II
99	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 blow down to steaming level	completely fill the boiler with deaerated feed water and maintain a slight pressure	drain and refill the boiler each week	drain and refill the boiler when the pH goes above 6
100	A water-tube type boiler is more efficient than a fire-tube type boiler as _____.	a water-tube boiler requires less maintenance	the water-tube boiler produces more pounds of steam per pound of boiler	Both "A" and "B"	Neither "A" or "B"
101	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
102	According to 46 CFR Part 61, 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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
103	According to 46 CFR Parts 59 and 35, which of the following is true?	The OCMI must be notified of emergency repairs to boilers and unfired pressure vessels.	The fuel burned in boilers of tank ships shall have a flash point of not less than 120°F.	A one gallon sample of each load of fuel oil shall be drawn and sealed at the time of supply and preserved until that fuel is exhausted.	All of the above.
104	According to 46 CFR, which of the following statements is true concerning main boiler safety 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.
105	According to 46 CFR's, all oil-fired main propulsion boilers with automatic burner safety control systems must be provided with _____.	controlled desuperheaters	stack temperature pyrostats	one flame detector for each burner	one flame detector in each furnace
106	According to 46 CFR's, 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 2 times maximum allowable pressure every 4 years.
107	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.
108	According to Coast Guard Regulations (46 CFR), a 1200 psig maximum allowable working pressure boiler, with external blow off piping is required to have the blow off piping withstand a minimum of _____.	1200 psig	1425 psig	1500 psig	1575 psig
109	According to Coast Guard Regulations (46 CFR), blow off 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

ID #	Question	Choice A	Choice B	Choice C	Choice D
110	According to Coast Guard Regulations (46 CFR), feed water 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
111	According to Coast Guard Regulations (46 CFR), fusible plugs are not permitted on auxiliary boilers where the maximum steam temperature to which they are exposed exceeds _____.	206°F	218°F	425°F	850°F
112	According to Coast Guard Regulations (46 CFR), periodic hydrostatic tests are required to be conducted without exception on all _____.	main propulsion boilers	auxiliary steam piping	air receivers	all of the above
113	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
114	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.
115	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
116	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)
117	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
118	According to Coast Guard Regulations (46 CFR), which of the following is classified as a boiler mounting?	Main feed check valve	Soot blower element	Blow off valve	Escape piping drain valve
119	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.
120	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
121	According to Coast Guard Regulations, boiler 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 fire room	all of the above
122	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.
123	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.
124	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 28.09 inches Hg, and 117.99 degrees Fahrenheit?	Subcooled liquid.	Saturated liquid.	Mixture of saturated liquid and vapor.	Superheated vapor.
125	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 29.00 inches Hg, and 85.21 degrees Fahrenheit?	Subcooled liquid.	Saturated liquid.	Mixture of saturated liquid and vapor.	Superheated vapor.
126	According to the illustration of a typical boiler furnace rear wall, which item number would best represent "insulating block"?	1	2	3	7
127	According to the illustration of a typical boiler furnace rear wall, which item number would best represent "insulating brick"?	1	2	3	7
128	According to the illustration of a typical boiler furnace rear wall, which item number would best represent "standard fire brick"?	1	2	3	7
129	According to the illustration, what part number identifies the "air door handle"?	4	6	7	12
130	According to the illustration, what part number identifies the "air doors"?	1	3	9	4
131	According to the illustration, what part number identifies the "diffuser"?	1	3	9	7
132	According to the illustration, what part number identifies the "igniter"?	2	3	7	9
133	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
134	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
135	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
136	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
137	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
138	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
139	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
140	After being required to plug an excessive number of leaking condenser tubes on the main condenser, what changes would you expect to observe when returning to normal steam plant sea speed operation?	Absolute pressure and hot well temperature will increase.	Absolute pressure will decrease and hot well temperature will increase.	Absolute pressure will increase and hot well temperature will decrease.	Absolute pressure and hot well temperature will decrease.
141	After patching refractory with plastic firebrick, holes are poked in the patch on 1 1/2 inch centers in order to _____.	prevent spalling	vent escaping moisture	allow for expansion	prevent slag buildup
142	After restoring the normal water level in a boiler following a high water casualty, you should _____.	immediately put the boiler on the line	immediately drain the economizer	blow down the water gage glass	completely drain the superheater
143	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
144	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
145	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
146	After the steam leaves the low pressure turbine, it enters the _____.	main condenser	feed and filter tank	first-stage feed water heater	turbine extraction valve manifold
147	Air accumulated in the aftercondenser of the air ejector unit is discharged directly to the _____.	intercondenser	high pressure turbine	main condenser	atmosphere
148	Air accumulated in the intercondenser of the air ejector assembly is discharged directly to the _____.	aftercondenser	high pressure turbine	main condenser	atmosphere
149	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
150	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
151	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
152	Air leaks through the inner or outer casings of a boiler will _____.	improve fuel combustion	decrease stack temperatures	cause boiler panting	reduce boiler efficiency
153	Air removed from the main condenser is vented to the atmosphere through the _____.	vacuum breaker	vent condenser	atmospheric drain tank	aftercondenser
154	Air trapped within the main condenser shell is detrimental 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
155	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
156	All oil-fired main boilers 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 for each burner	one flame detector in each furnace
157	All oil-fired main propulsion boilers 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
158	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
159	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
160	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
161	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	maintaining a normal level of scavenging agents
162	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
163	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
164	An adequate phosphate reserve should be maintained in boiler water to _____.	prevent hard scale formation	reduce the blow down frequency	maintain a pH of 7	remove dissolved oxygen concentrations
165	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
166	An advantage of using boiler furnace studded water wall tubes packed with refractory is _____.	thinner tubes can be used	fewer tubes are required	lower quality steel can be used	lower furnace wall operating temperature
167	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
168	An excessively high superheater temperature could be the result of _____.	excessive air	high feed water temperature	soot accumulation on the superheater	excessive steam demand
169	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
170	An incandescent white flame in a boiler firebox would indicate _____.	efficient combustion	low fuel oil temperature	excessive fuel oil pressure	too much excess air
171	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
172	An increase in the pressure drop between the inlet and outlet of the feed water heater waterside, not due to a waterside obstruction, would indicate _____.	insufficient water velocity through the heater	a water flow rate higher than feed water heater design limits	fouling of the heater steam side	an accumulation of non-condensable gases in the steam circuit
173	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
174	An indication of a moderate leak existing in a desuperheater is _____.	high auxiliary steam pressure	low auxiliary steam temperature	reduced feed water consumption	a sudden increase in make-up feed
175	An indication of excessive soot accumulation on boiler water tubes and economizer surfaces is _____.	low stack temperature	high stack temperature	lower feed water flow	high feed water temperature
176	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
177	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
178	Any feed water testing done on a routine basis would normally include testing for _____.	chloride	phosphate	electrical conductivity (total dissolved solids)	all of the above
179	Arrow "B" shown in the illustration indicates the _____.	regenerative air heater	retractable soot blower opening	combustion air inlet	uptakes
180	As a general rule, for proper results castable fireclay must be air cured for _____.	12 hours	18 hours	24 hours	48 hours or longer
181	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.
182	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	introduce a control for maintaining constant superheated steam temperature regardless of boiler load	introduce a control for maintaining constant steam pressure regardless of boiler load
183	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
184	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
185	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
186	As the pH of the boiler water approaches zero, the water becomes increasingly _____.	soft	alkaline	neutral	acidic

ID #	Question	Choice A	Choice B	Choice C	Choice D
187	As the rate of combustion is increased in a boiler, more steam is generated because the _____.	fires are hotter	mass flow rate of hot gas increases	furnace becomes hotter	flue gas turbulence decreases
188	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.
189	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
190	At a given pressure, erosion of steam piping and machinery will be minimized by utilizing _____.	superheated steam	desuperheated vapor	wet steam	saturated steam
191	At which point of the blistered boiler tube shown in illustration will the temperature be the greatest?	A	B	C	D
192	Automatic fuel shutoff to the burners of a main propulsion boiler could result from _____.	high boiler water level	carbon deposits on the ignition electrode	dirty flame scanner	excessive fuel return pressure
193	Auxiliary exhaust steam can generally be used as a supply for the _____.	air ejectors	steam atomizers	air heater supply	fuel oil heaters
194	Auxiliary steam at full operating pressure is supplied from the boiler directly to the _____.	turbo generators	main air ejectors	distilling plants	soot blowers
195	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
196	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
197	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
198	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
199	Before giving a boiler a surface blow when underway at sea, you should _____.	raise the water level 2 or 3 inches above normal	lower the water level 2 to 3 inches below normal	increase forced draft air pressure to maximum	temporarily secure all burners on that boiler
200	Before giving a boiler a surface blow, you must _____.	open the skin valve on the blow down line	secure the fires in the furnace	lower the water level to a half glass	increase the boiler steam pressure above normal
201	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
202	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
203	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
204	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
205	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
206	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
207	Blisters developing on boiler tubes can be caused by _____.	air in the feed water	cold feed water	hot feed water	waterside scale deposits
208	Blowing down a water wall header while steaming a boiler at a high firing rate could result in _____.	excessive strain on boiler blow down lines	the thermo-hydraulic feed water regulator valve slamming closed	a load imbalance between other boilers on the line	an interruption in the water circulation
209	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
210	Boiler firesides must be kept free of soot accumulations because _____.	soot interferes with the flow of feed water	the steam drum internals will become clogged	the fuel oil heaters will become overloaded	soot insulates the boiler heating surfaces
211	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
212	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
213	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
214	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 feed water passing through the boiler economizer
215	Boiler refractories previously baked out and fired are most sensitive to _____.	rapid cooling	sustained high furnace temperature	rapid heating	radiant heat of the burner
216	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
217	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
218	Boiler screen tubes are used to protect which of the listed components from high furnace temperature?	Superheater	Refractory	Wall tubes	Steam drum
219	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
220	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
221	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
222	Boiler tube failures can result from _____.	corrosion	overheating	mechanical stress	all of the above
223	Boiler water hardness is increased by _____.	zero alkalinity in the water	scale forming salts in the feed water	dissolved gases in the water	improper operation of the DC heater
224	Boiler water samples should be circulated through a cooling coil prior to analysis because _____.	this prevents the boiler water from flashing into steam as the sample is collected	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
225	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
226	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
227	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	the degree of atomization is not dependent upon fuel oil pressure
228	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.
229	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
230	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
231	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
232	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
233	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
234	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
235	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
236	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
237	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	operating under low load conditions for extended periods
238	Chemicals are added to boiler feed water to _____.	reduce the frequency of blow downs	prevent precipitation of sludge	decrease heat transfer	precipitate dissolved oxygen

ID #	Question	Choice A	Choice B	Choice C	Choice D
239	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
240	Chemicals are added to boiler water in order to _____.	reduce oxygen corrosion	reduce the total dissolved solids content	decrease the necessity for blow downs	eliminate dissolved chlorides
241	Chemicals are added to boiler water to _____.	eliminate the need for blow downs	stabilize feed water if a boiler becomes salted up	prevent scale forming deposits	maintain an acidic condition in the feed water
242	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
243	Circulation of boiler water to the water wall tubes is maintained by the _____.	water screen tubes	risers	downcomers	generating tubes
244	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 feed water pressure	back pressure in the steam drum acting on the user tubes
245	Clean low pressure steam drains are collected in the _____.	deaerating feed water heater	contaminated drain inspection tank	atmospheric drain tank	main condenser hot well
246	Coast Guard Regulations (46 CFR Part 52) concerning boiler superheater safety valves require that the valve _____.	be set at a lifting pressure that is higher than the drum safety valve	have a drain opening tapped for not less than 1/4 in. NPS	be constructed with a cast iron body	have a threaded inlet connection if greater than 2 in. NPS
247	Coast Guard Regulations (46 CFR Part 56) permit copper pipe to be used for steam service subjected to a maximum pressure and temperature of _____.	350 psi and 460°F	350 psi and 406°F	250 psi and 460°F	250 psi and 406°F
248	Coast Guard Regulations (46 CFR Part 56) 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
249	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
250	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
251	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
252	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
253	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.
254	Coast Guard Regulations (46 CFR) permit repairs and adjustments 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
255	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
256	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
257	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)
258	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
259	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 not more than 100°F	70°F and not more than 160°F	60°F and not more than 120°F	100°F and not more than 200°F

ID #	Question	Choice A	Choice B	Choice C	Choice D
260	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
261	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 fuel oil header	fuel oil settling tanks	fuel oil service heaters
262	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
263	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
264	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
265	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)
266	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
267	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
268	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 fire room
269	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%

ID #	Question	Choice A	Choice B	Choice C	Choice D
270	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
271	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)
272	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)
273	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
274	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
275	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
276	Coast Guard Regulations, 46 CFR Part 54, require steam safety and relief valves to be provided with a substantial lifting device, capable of lifting the disc from its seat at what percentage of the set pressure?	0%	25%	75%	90%
277	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
278	Combustion gases can leak into the fire room through _____.	desuperheater seals	fouled burner registers	idle burner assemblies	soot blower swivel tube packing glands
279	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
280	Component "B" shown in the illustration is properly identified as the _____.	drumhead	wrapper sheet	tube sheet	drum crown

ID #	Question	Choice A	Choice B	Choice C	Choice D
281	Condensate accumulating in the steam side of a fuel oil heater could result in _____.	overheating	scale accumulation	corrosion	immediate oil contamination of the condensate
282	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
283	Condensate from fuel oil heating coils return to the _____.	feed water heater	engine room bilge	reserve feed tank	drain inspection tank
284	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
285	Condensate pumps have distinctly noticeable characteristics and can usually be 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
286	Condensate return lines from tank heating coils are led to the _____.	atmospheric drain tank	main condenser	DC heater	contaminated drain system
287	Contaminated steam generators in a contaminated drain system are usually _____.	single effect	double effect	triple effect	multistage flash type
288	Cooling water to the vent condenser in a DC heater is supplied by the _____.	salt water circulator	main feed pump	feed booster pump	main and/or auxiliary condensate pump
289	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
290	Corrosion of the flue gas side of the economizer can be a result of the _____. I. stack gas temperature being lower than the dew point II. feed water temperature being excessively cool	I only	II only	both I and II	neither I or II
291	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
292	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
293	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
294	Deaeration of condensate primarily occurs in what section of the illustration shown.	DFT	main condenser hot well	distilled water tank	first stage feed heater
295	Depending upon the design of the boiler, the constant pressure maintained at the steam drum or the superheater outlet is known as the _____.	designed maximum pressure	overload pressure	operating pressure	output pressure
296	Desuperheated steam can be found at the _____.	main steam stop	generator steam stop	spray attemperator outlet	high pressure turbine steam chest
297	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
298	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
299	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 feed water	water hammer in the economizer	increased back pressure
300	Discharging an excessive amount of make-up feed water into the DC heater during normal steaming conditions could cause _____.	loss of feed pump suction	decreased auxiliary exhaust pressure	water hammer in the economizer	increased air ejector discharge temperature
301	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
302	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
303	Dissolved oxygen entrained in the feed water entering a boiler can cause _____.	erosion	localized pitting	caustic embrittlement	acid corrosion
304	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
305	Dissolved oxygen in the condensate is generally attributed to _____.	steam leaks into the gland leakoff	improper operation of the gland exhauster	adding make up feed	vapor lock in the condensate pump
306	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
307	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
308	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	Neither I or II
309	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	Neither I or II
310	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	Neither I or II
311	Downcomers are used in modern boilers to _____.	circulate water to the mud drum	cool the superheater	preheat the feed water	remove soot from the firesides
312	Downcomers installed in water-tube boilers function to _____.	distribute feed water within the water drum	decrease the end point for moisture carryover	accelerate the generation of superheated steam	accelerate water circulation in the boiler
313	Downcomers installed in water-tube boilers function to _____.	distribute feed water 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
314	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
315	During cold ship start-up, you should open the feed water outlet and condensate valves to a DC heater in order to _____.	avoid running the feed pump 'dry'	expel non-condensable vapors from the vent	thoroughly atomize incoming condensate	prevent excessive pressure
316	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
317	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
318	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
319	During normal operation, the steam flow from the auxiliary exhaust line to the DC heater can be closely related to the _____.	spring pressure of the spray valves	water level in the DC heater reservoir	the temperature and quantity of the condensate flow to the DC heater	rate of evaporation in the DC heater
320	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
321	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
322	Efficient combustion in a boiler is indicated by a _____.	white haze	brown haze	yellow haze	black haze
323	Eight (8) ounces of oxygen, dissolved in 500,000 pounds of water, is a concentration of _____.	1.0 ppm	4.0 ppm	8.0 ppm	16.0 ppm
324	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 hot well	decreasing the volume of water in the system
325	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
326	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
327	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
328	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
329	Excess free oxygen in the boiler feed water can be the result of _____.	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
330	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
331	Excessive alkalinity of boiler water will cause _____.	caustic embrittlement	scale formation	calcium carbonate precipitation	sodium sulfite reacting with dissolved oxygen
332	Excessive carbon dioxide formed by improper chemical treatment in the boiler, may cause corrosion in the _____.	condensate lines	boiler superheater tubes	boiler generating tubes	main and auxiliary steam lines
333	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
334	Excessive condensate depression can result in _____.	overheated air injectors	high condensate discharge temperature	decreased plant operating efficiency	insufficient condensate sub cooling
335	Excessive condensate depression will result in _____.	increased oxygen rejected in the condenser	decreased steam consumption	excessive condensate temperatures	increased air absorption by the condensate
336	Excessive foaming in a steaming boiler can cause damage to the _____.	superheater	desuperheater	economizer	internal feed pipe
337	Excessive recirculation of condensate should be avoided, as it can cause _____.	excessive cooling of the condensate	overheating of the air ejectors	the condenser hot well to be completely drained at low speeds	overheating of the vent condenser
338	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
339	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
340	Excessive water flow beyond the design limits of a feed water 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
341	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
342	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
343	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
344	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
345	Failure to remove calcium and magnesium from feed water before it reaches the boiler can result in tube _____.	scaling	pitting	sludging	erosion
346	Feed water 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
347	Feed water is deaerated to prevent _____.	cavitation in the feed pump	corrosion in the boiler	loss of system vacuum	all of the above
348	Ferrous sulfate tends to go into solution in boiler water when the value of the hydrogen ion concentration increases. Consequently, the water in a 900 psi boiler should be _____.	pure with zero pH value	pure and treated to a pH value of 4.0 to 4.5	maintained at a pH value of 7.0	pure and treated to a pH value of 10.5 to 11.0
349	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
350	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
351	Fireside burning of boiler tubes can be a result of _____.	slag deposit	improper atomization	soot accumulations	waterside deposits
352	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
353	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
354	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
355	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
356	Fluctuations in the atomizing steam pressure at the burners could be caused by a/an _____.	malfunctioning condensate drain in the atomizing steam system	incorrectly assembled air register	partially closed atomizing fuel valve	partially opened recirculating valve
357	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
358	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
359	Foaming in a boiler can be caused by _____.	high total solids	high alkalinity	excessive phosphate	all of the above
360	Foaming in boiler water is a result of _____.	carryover	excessive suspended solids	low water level	excessive surface blows
361	Foaming in boiler water is caused by _____.	neutral water	acidic contamination	high boiler water alkalinity	low boiler water alkalinity
362	From which of the areas listed are condensate drains normally collected and returned to the atmospheric 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
363	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
364	Fuel oil accumulation in a boiler double front is generally caused by _____.	leaking fuel oil strainers	low return line pressure	dripping atomizers	insufficient air
365	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
366	Fuel oil is heated before atomizing to _____.	reduce the viscosity	increase the viscosity	raise the fire point	lower the flash point
367	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
368	Fuel oil is transferred from storage tanks to the settling tanks to allow for _____.	blending with atomizing steam	purging of any large air bubbles that have formed	heating to separate water and sediment	heating to the correct temperature for proper atomization
369	Fuel oil is transferred to the settling tanks for _____.	the purpose of removing any volatile gases present in the fuel	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 burner atomization
370	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
371	Fuel oil passing through the burners is divided into fine particles by the _____.	diffuser	air register	sprayer plate	air foils
372	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
373	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
374	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
375	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
376	Gasket leakage around boiler handholes may be caused by _____.	improper positioning of the gasket	pitted seating surfaces	loose dogs	all of the above
377	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
378	Heat blisters forming on the first row of the generating tubes are caused by _____.	fireside deposits	low water level	flame impingement	waterside deposits
379	Heat introduced to the condenser by exhausting steam is removed by the circulation of _____.	reserve feed water	cold condensate	low pressure drains	seawater
380	Heating the fuel oil to an excessively high a temperature in a fuel oil heater will cause _____.	a loss of fuel oil suction	over firing the boiler	leakage at the burners	fouling of the heater
381	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
382	High boiler water level can cause carryover and _____.	damage to the economizer	warped screen tubes	warped water wall tubes	damage to the superheater tubes
383	High pressure and low pressure drain systems are part of the _____.	condensate drain system	auxiliary turbine bleed system	contaminated drain system	boiler drain system
384	High pressure steam drains are normally discharged to the _____.	DC heater	atmospheric drain line	reserve feed tank	drain and inspection tank
385	High pressure steam drains from systems operating at above 150 psi are normally collected in the _____.	atmospheric drain tank	contaminated drain inspection tank	deaerating feed water heater	distilled water tank
386	High salinity can be reduced in a steaming boiler by adding caustic soda, phosphate, and then _____.	using the continuous blow down	steaming at a low firing rate for 24 hours	adding hydrazine to control dissolved oxygen	adding calcium carbonate to precipitate solids
387	High temperature at the superheater outlet would be caused by _____.	outer casing leakage	improper turn down ration	rapid fuel oil atomization	excessive excess air
388	High temperature at the superheater outlet would NOT be caused by _____.	outer casing leakage	high feed water temperature	poor fuel oil atomization	too much excess air
389	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.
390	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
391	How is the nozzle in a nozzle reaction safety valve held in place?	Press fit	Lock nut	Machine threads	Spot weld
392	Identify the system shown in the illustration.	Bleed steam	Auxiliary steam	High pressure drains	Auxiliary condensate
393	Identify the system shown in the illustration.	Bleed steam	Auxiliary steam	High pressure drains	Auxiliary condensate
394	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
395	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
396	If a boiler generates saturated steam at 125.3 psig, how much heat is required to change the water into steam if the feed water temperature is 240°F?	30.5 Btu/lb	116.5 Btu/lb	582.7 Btu/lb	983.4 Btu/lb
397	If a boiler is being operated with the inlet feed water bypassing the economizer, which of the following is true?	The fuel consumption will increase for the same boiler load.	There is always the danger of burning the economizer tubes.	Less heat is actually being transferred to the superheated steam because of the decrease in feed water flow	all of the above
398	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 blow down lines	erratic operation of the automatic feed water regulating valve	load imbalance between other boilers on the line	interruption of water circulation
399	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
400	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.
401	If a boiler is smoking black and increasing the boiler front air box pressure does not reduce the smoke, the cause can be _____.	forced draft fan failure	dirty atomizers	heavy soot on tubes	high ambient air temperature
402	If a boiler is smoking black and increasing the boiler front air box pressure does not reduce the smoke, the cause can be _____.	forced draft fan failure	heavy soot on tubes	low fuel oil temperature	high air heater temperature
403	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
404	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
405	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
406	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 feed water regulator.
407	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
408	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
409	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 feed water supply to keep the boiler cool	speeding up the forced draft fans to blow steam up the stack
410	If a main condenser were operating with a vacuum of 28.09 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	5.5°F	3.24°F
411	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 fire room ventilation.	Purge the fuel oil system.
412	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 feed water temperature is too low
413	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%
414	If a routine boiler water test indicates high salinity, you should blow down 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
415	If a salinity alarm system indicates 2.5 grains per gallon at the main condensate pump discharge, your first action should be to _____.	blow down the boilers and add make up water	chemically test the condensate for chloride content	increase the hydrazine dosage in the condensate line	open the main condensate recirculating valve
416	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
417	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
418	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	warping of the soot blower element	insufficient steam pressure to the soot blower element
419	If a steaming boiler begins 'panting,' the probable cause is _____.	too much air for proper combustion	excessively high furnace temperature	excessively high fuel oil temperature	insufficient air for proper combustion
420	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
421	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	blow down the gage glass to verify a low water condition
422	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	blow down the gage glass to verify a low water condition
423	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 feed water bypass regulator	blow down the boiler gauge glass	slow down the engines	cut out the fires
424	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
425	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 _____.	21.0%	33.0%	79.0%	87.0%
426	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 _____.	79.0%	33.0%	21.0%	14.0%
427	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 _____.	10.5%	14.0%	21.0%	79.0%
428	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
429	If an oil fire occurs in the double casing of a steaming boiler, you should _____.	increase the forced draft fan speed	secure the feed water supply to the boiler	secure the fuel oil supply to the burners	apply water with a smooth bore nozzle

ID #	Question	Choice A	Choice B	Choice C	Choice D
430	If an oil fire occurs in the double casing of a steaming boiler, you should _____.	increase the forced draft fan speed	immediately secure the feed water supply to the boiler	secure the fires and air supply and activate the steam smothering system	apply water with a smooth bore nozzle
431	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
432	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	feed water crossover line	internal desuperheater flange
433	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
434	If it is necessary to operate a turbine driven main feed pump at shut off head, or at less than 20% 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.
435	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 feed water heater	makeup feed water tank
436	If manual control of the water level in a steaming boiler is required, the proper method of control is with the auxiliary feed _____.	stop-check valve	stop valve	pump speed control	pump pressure control
437	If oil is found in the main fuel oil heater steam drain system, which of the actions listed should be taken first?	Change over fuel supply to diesel fuel.	Shift over to the standby heater and monitor contaminated drain tank for additional traces of oil.	Bottom blow the boiler using the continuous blow line.	Shift over to the low fuel oil suction on the day tank.
438	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
439	If one burner of a group of operating steam atomizing 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
440	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
441	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
442	If the bellows in a thermo-hydraulic feed water control valve ruptures, the boiler water level will _____.	decrease only	increase only	decrease initially and then increase	increase initially and then decrease
443	If the bellows in a thermo-hydraulic feed water control valve ruptures, the boiler water level will _____.	increase only	decrease only	increase initially and then decrease	decrease initially and then increase
444	If the boiler fires are extinguished by water contamination in the fuel oil, you should FIRST _____.	secure the burner valves	secure the settler tank suction	reduce the load on the boiler	purge the boiler furnace
445	If the boiler water and condenser hot well 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
446	If the boiler water level is normal, the main condenser hot well level is normal, and the DC heater level is 40% full, you should _____.	prime the condensate pump	bypass the vent condenser	slow the main unit	open the makeup feed vacuum drag line
447	If the condensate level in the loop seal of the air ejector intercondenser is lost, _____.	no condensate will flow through the system	air will be drawn back into the main condenser	the air ejector will not transfer heat to the condensate	the air ejector will overheat
448	If the condensate level 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
449	If the control air pressure for an automatic combustion control system is lost during maneuvering, you should immediately _____.	switch to manual control	blow down the air receiver	attempt to restart the air compressor	secure the boilers
450	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.	DC heater level will rise	Main condenser absolute pressure will increase.
451	If the DC heater relief valve lifts frequently, the cause can be excessive _____.	condensate supplied to the DC heater	auxiliary exhaust steam pressure	feed water recirculated from the feed pump	makeup feed introduced to the system
452	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 outlet temperature to decrease	cause the feed water temperature to increase above the designed outlet temperature	cause the automatic make-up feed valve to cycle open

ID #	Question	Choice A	Choice B	Choice C	Choice D
453	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	blow down the gage glass	start the standby feed pump
454	If the entire pneumatic control to a multi-element feed water regulator fails, the feed water valve is controlled by _____.	constant pump pressure regulator	remote manual control regulator	single-element feed water regulator	local manual control
455	If the feed water flow sensor of a multi-element feed water regulator fails, the valve will be controlled as a _____.	single element feed water regulator	double element feed water regulator	triple element feed water regulator	local manual control device
456	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
457	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
458	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.
459	If the fires to a steaming boiler have been accidentally 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
460	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
461	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
462	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.
463	If the gage glass water level remains constant in a steaming boiler while maneuvering, the most probable cause is a _____.	broken feed water regulator	restricted gage glass line	properly operating feed pump	high water level
464	If the low water level alarm sounds on an automatically fired boiler, and the low water cutout fails to function, you must immediately _____.	blow down the gage glass to determine where the water level is	increase the feed water supply to maintain the water level	start the emergency feed water injector to restore the normal water level	secure the fires to minimize damage to the boiler tubes
465	If the main condenser were operating at a vacuum of 28.5"Hg, a condensate discharge temperature of 86°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	0.7 inches Hg	4 degrees Fahrenheit	7 degrees Fahrenheit

ID #	Question	Choice A	Choice B	Choice C	Choice D
466	If the main condenser were operating at a vacuum of 28.7"Hg, a condensate discharge temperature of 81°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
467	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	blow down be reduced
468	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	blow down be reduced
469	If the pressure becomes excessive in the auxiliary exhaust system of a steam propulsion plant, the excess steam will normally be dumped to the _____.	deaerating feed tank	vent condenser	reduced steam system	main condenser
470	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
471	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
472	If the salinity indicator periodically registers high salinity in the main hot well, the cause may be _____.	leaking air ejector condenser tubes	leaking tubes in the third-stage heater	excessive water pressure in the lube oil cooler	a contaminated distilled water tank
473	If the stack temperature is higher than normal, this could indicate _____.	low fuel oil back pressure	too much excess air	high feed water pressure	external boiler casing leakage
474	If the steam flow input device to a two-element feed water regulator valve fails, the regulator operates as a _____.	constant pump pressure regulator	remote manual control regulator	single-element feed water regulator	local manual control
475	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
476	If the temperature of the fuel oil entering an atomizer is too low, the burner will _____.	produce smoke white	require more fuel for atomization	produce heavy black smoke at any load condition	require more excess air for combustion
477	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
478	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
479	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
480	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
481	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 feed water going to the boiler.	Check the DC heater water level.	Blow down the boiler.	Secure the boiler fires.
482	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	lowdown the gauge glass to find the true water level	speed up the feed pump to raise the water to normal
483	If 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 that boiler.	Raise the feed pump pressure.	Blow down the gage glass.	Secure the steam stop to that boiler.
484	If the water level in the boiler water gage glass is not in sight, and the automatic feed water 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
485	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 for high water level in the drum	reduce the forced draft fan speed
486	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 valve until all moisture is drained, shut the drain line valve, and slowly open the steam valve again.	Continue to fully open the steam valve and partially open the drain line valve until all moisture is drained and then shut the drain line valve.	Stop opening the steam valve, open the drain line valve, resume opening the steam valve slowly, and shut the drain line valve 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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
487	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.
488	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
489	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
490	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
491	Improper boiler feed water 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 hot well level	all of the above
492	Improper fuel oil burner atomization can be generally attributed to _____.	low draft air pressure	using the same size burner tips in all burners	high fuel oil temperature	high fuel oil viscosity
493	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
494	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 feed water temperature	Insufficient combustion air	Low feed water temperature	DFT excessive vapor pressure
495	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
496	In a boiler equipped with a convection type superheater, the superheater tubes are located _____.	in a position screened from the furnace flame	in the direct path of radiant heat flow	in a separately fired convection furnace	on the fireside of the screen tubes
497	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
498	In a boiler equipped with an automatic feed water regulator, erratic variations in the water level could be caused by _____.	high solids content and foaming in the drum	ruptured feed water control valve diaphragm	low feed water temperature	high feed water temperature
499	In a boiler furnace, incomplete combustion due to insufficient air yields an excess amount of _____.	carbon dioxide	carbon monoxide	nitrogen oxide	sulfur dioxide
500	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
501	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
502	In a closed feed and condensate system, to where do the main air ejector after condenser drains directly drain?	auxiliary condenser	loop seal	atmospheric drain tank	deaerating feed tank
503	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.
504	In a closed feed water system, the greatest deaeration of condensate occurs in the _____.	DC heater	atmospheric drain tank	air ejector condenser	vent condenser
505	In a closed steam and water cycle, which of the conditions listed could prevent main condenser vacuum from reaching the desired level?	Excess steam leaking from the turbine glands.	Abnormally low atmospheric drain tank level.	Main condensate recirculating valve open during maneuvering.	Dirty boiler economizer tubes.
506	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
507	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
508	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
509	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
510	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
511	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
512	In a marine boiler equipped with mechanically atomized burner assemblies, proper combustion depends on the _____.	fuel oil pressure	speed of the forced draft fan and quantity of excess air	temperature of the fuel oil	all of the above
513	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 feed water temperature of 212°F in the economizer	keeping the watersides free from scale deposits
514	In a marine condenser designed with a reheating hot well, the hot well 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
515	In a modern high pressure steam plant, most feed water deaeration takes place in the _____.	atmospheric drain tank	air ejector condenser	DC heater	vent condenser
516	In a multi-burner firebox, a burner tip with a worn and 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
517	In a multi-burner firebox, a burner tip with a worn and enlarged orifice will _____.	have no effect on the flow of oil if the proper pressure is maintained	result in an uneven heating of the furnace	cause a high fuel oil return line back pressure	cause smokeless and flameless combustion
518	In a properly designed boiler, which end point is most likely to occur first?	Evaporation	Circulation	Combustion	Moisture carryover
519	In a properly designed boiler, which of the end points should be reached first?	Carryover	Circulation	Evaporation	Combustion
520	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
521	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
522	In a single furnace boiler, where is the steam typically cooled for use as auxiliary steam?	Superheater	Desuperheater	Condenser	Air ejector
523	In a single-element feed water 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	feed water flow to the boiler
524	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
525	In a steam assist atomizer, the fuel oil/steam mix takes place entirely within the _____.	tangential slots	mixing chamber	whirling chamber	fuel oil swirlers

ID #	Question	Choice A	Choice B	Choice C	Choice D
526	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
527	In a steam propulsion plant, the primary source of auxiliary exhaust steam is from the _____.	main condenser	main feed pump	distilling plant	air heaters
528	In a steaming boiler most dissolved chlorides tend to concentrate at or near the _____.	tube joints	feed pipe	mud drum	water surface
529	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
530	In a steaming boiler, most dissolved chlorides tend to concentrate at, or near, the _____.	tube joints	mud drum	water surface	floor tubes
531	In a water tube 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
532	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
533	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
534	In a water-tube boiler, sludge is most likely to collect in the _____.	generating tubes	downcomer tubes	screen tubes	floor tubes
535	In a water-tube boiler, waterside scale formation is caused by _____.	sodium phosphate	calcium sulfate	magnesium phosphate	sodium hydroxide
536	In accordance with Coast Guard Regulations (46 CFR Part 56), all vessels having oil fired boilers must be equipped with _____.	one positive-displacement type fuel service pump	Suction and discharge strainers capable of being cleaned without interrupting the oil supply	one fuel oil heater if shown that the normally used fuel oil will be of low viscosity	all of the above
537	In accordance with Coast Guard Regulations (46 CFR Part 62) 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
538	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
539	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
540	In accordance with Coast Guard Regulations (46 CFR), the maximum allowable working pressure of a water-tube boiler must be stamped on the _____.	burner front	lower header	name plate	drum head
541	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
542	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.
543	In addition to a nozzle, a fuel oil atomizer uses which of the listed parts?	Ignition electrode	Burner cone	Sprayer plate	Air cone
544	In addition to an orifice plate, a fuel oil atomizer uses which of the listed parts?	Ignition electrode	Burner cone	Sprayer plate	Air cone
545	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
546	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
547	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
548	In an air register assembly, the majority of air passes through the _____.	diffuser or impeller	atomizer assembly	stationary air foil or blade cone	distance piece
549	In an automatically fired boiler, increasing the temperature of the feed water 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

ID #	Question	Choice A	Choice B	Choice C	Choice D
550	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
551	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 feed water consumption	localized overheating of tube surfaces
552	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
553	In automatic combustion control systems, increasing or decreasing a loading pressure by a set amount is called _____.	biasing	loading	relaying	transmitting
554	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
555	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
556	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.
557	In order to test the lifting pressure of the deaerating feed heater relief valve, you would _____. I. close the auxiliary exhaust dump valve to the main and auxiliary condensers II. increase the set point of the make-up steam regulator to the auxiliary exhaust system	I only	II only	Both I and II	Neither I nor II
558	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 condenser II. increase the set point of the reduced steam pressure to the auxiliary exhaust system	I only	II only	Both I and II	Neither I nor II

ID #	Question	Choice A	Choice B	Choice C	Choice D
559	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
560	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
561	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
562	In the boiler shown in the illustration, the arrow "C" indicates a _____.	downtake nipple	water wall header	sliding foot	recirculating header
563	In the boiler shown in the illustration, the arrow "E" indicates a _____.	water wall tube	recirculating tube	support tube	downcomer
564	In the boiler steam and water system, pressure is highest in the _____.	steam stop	dry pipe	feed line	mud drum
565	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
566	In the event of a failure of the pneumatic control system, a multi-element feed water regulator is designed to operate as a _____.	constant-pressure regulator	constant-volume feed water regulator	manually controlled feed water regulator	thermo-hydraulic feed water regulator
567	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	plant operation can be continued while repairs are being made to a defective unit	oil leakage into the condensate system is less likely with multiple system
568	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
569	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
570	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
571	In which of the following types of condensers would you find the cooling water passing through tubes with the turbo generator exhaust steam directed around the outside of the tubes?	Jet	Barometric	Surface	Collins
572	In which of the listed components is chemical energy converted to thermal energy with regards to boiler operation?	Furnace	Superheater	Steam drum	Economizer

ID #	Question	Choice A	Choice B	Choice C	Choice D
573	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
574	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
575	Increasing the blow down 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
576	Increasing the temperature of the feed water 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
577	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
578	Insufficient combustion air supply to a boiler furnace can cause _____.	low superheater temperature	high stack temperature	high superheater temperature	sputtering fires
579	Insufficient combustion air supply to the furnace would cause _____.	the fires to sputter	low superheater outlet temperature	high stack temperature	high feed water consumption
580	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
581	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
582	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
583	Longitudinal expansion of a boiler water drum is allowed for at the boiler _____.	tube sheet	casing joints	foundation sliding feet	refractory expansion joint
584	Longitudinal expansion of a boiler water drum is permitted by the _____.	tubes	casing	foundation	refractory
585	Low stack gas temperature should be avoided to reduce _____.	economizer thermal stress	sulfuric acid formation	back pressure in the uptakes	air heater thermal stress
586	Low stack gas temperatures due to light boiler loads should be avoided in order to reduce the _____.	percentage of carbon monoxide in the stack gas	formation of dew point sulfuric acid	heat loss through the uptakes	accumulation of soot
587	Low steam pressure in a steaming boiler can be caused by _____.	low steam demand	high feed water temperature	low water level	large sprayer plates
588	Lower boiler efficiency results from carrying too much excess air because _____.	it varies the degree of deposits on heat absorbing surfaces	it increases the volume and temperature of the furnace gas leaving the stack	it decreases the volatility of the fuel	the flame temperatures are lower

ID #	Question	Choice A	Choice B	Choice C	Choice D
589	Lower than normal steam pressure in an operating boiler may be caused by _____.	a sudden drop in superheater outlet temperature	high feed water temperature	a low water level in the steam drum	boiler water contamination
590	Machinery operating features are designed to help conserve energy. Which of the following will not contribute to a system's thermal efficiency?	Reduction of friction.	Insulation of hot surfaces.	Lubrication of moving parts.	Elevation of heat sink temperatures.
591	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
592	Main propulsion steam turbine casing drains generally discharge to the _____.	contaminated drain tank	main condenser	bilge	atmospheric drain tank
593	Main steam turbine lubricating oil systems are fitted with _____.	floating strainers	magnetic strainers	centrifugal strainers	cestus strainers
594	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
595	Makeup feed water is brought into an operating closed feed system via the _____.	main feed pump	auxiliary feed pump	feed booster pump	condenser vacuum drag line
596	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
597	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 feed water temperature of 212°F	keeping the watersides free from scale deposits
598	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
599	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
600	Most marine boilers are designed to produce _____.	superheated steam only	saturated and superheated steam	saturated steam only	superheated and supercritical steam
601	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 feed water by the feed pump	the turbulence of high pressure feed water entering the steam drum

ID #	Question	Choice A	Choice B	Choice C	Choice D
602	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
603	Noise caused by condensate striking bends or fittings in a steam pipe line is called _____.	condensate depression	water hammer	piston slap	hydraulic lock
604	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
605	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
606	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
607	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
608	On a boiler equipped with an uncontrolled interdeck superheater, reducing the feed water temperature to the steam drum will cause the superheater outlet temperature to _____.	rise	decrease	rise momentarily then decrease	remain constant
609	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
610	On a boiler safety valve, the blow down adjusting ring is locked in place by a _____.	set screw	locknut	wire seal	cotter pin
611	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.
612	On an operating boiler, the superheater safety valve shown in the illustration is set to lift at 670 psi and reseal at 630 psi. To increase the lifting pressure to 700 psi, but maintain the previous reseal pressure, you would turn the compression screw _____.	in the clockwise direction only	in the counterclockwise direction only	clockwise direction and lower adjusting ring	counterclockwise direction and raise the adjusting ring
613	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
614	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
615	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 feed water supply to the boiler	close the main steam stop
616	One factor for determining the minimum feed water 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
617	One function of a steam drum desuperheater installed in a high pressure boiler would be to _____.	maintain the essential flow of feed water into the drum	raise the boiler water temperature in the steam drum	lower the temperature of the steam entering the superheater	lower the temperature of the steam in the steam drum
618	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
619	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
620	One function of the desuperheater installed in a boiler steam drum is to _____.	raise the temperature of the steam in the dry pipe	distribute feed water within the boiler	provide steam for auxiliary machinery	add moisture to superheated steam
621	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 feed water throughout the drum
622	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
623	One of the functions of a boiler desuperheater installed in a high pressure boiler is to _____. I. maintain the essential flow of feed water into the drum II. heat the boiler water in the steam drum	I only	II only	Both I and II	Neither I nor II
624	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
625	One of the operating conditions sensed by a two-element feed water regulator is _____.	feed water flow	steam flow	fuel pressure	steam pressure
626	One of the purposes of chemically treating boiler water is to _____.	reduce blow down frequency	reduce scale formation	eliminate waterside cleaning	constantly decrease alkalinity

ID #	Question	Choice A	Choice B	Choice C	Choice D
627	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
628	Overheating of the generating tubes will occur when a boiler reaches its end point of _____.	evaporation	circulation	combustion	moisture carryover
629	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
630	Panting or rumbling in a boiler furnace is usually caused by _____.	too much air	not enough air	low fuel temperature	low fuel pressure
631	Phenolphthalein indicator is used in the boiler water test for _____.	dissolved oxygen	alkalinity	chloride content	hardness
632	Phenolphthalein is used as an indicator to test boiler water for _____.	hardness	alkalinity	hydrazine	chloride content
633	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
634	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
635	Prior to lighting a burner in a cold boiler, you should _____.	close the superheater vent	blow down the mud drum	open the surface blow valve	thoroughly purge the furnace
636	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
637	Proper lagging of a single-element feed water 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
638	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
639	Proper vacuum must be maintained in the main condenser to _____.	run auxiliary machinery	maintain plant efficiency	utilize circulating seawater	cool the lube oil supply
640	Pulsating boiler furnace fires can be caused by _____.	low fuel temperature	too much air	low fuel pressure	too little air
641	Pumps normally used for fuel oil service are _____.	positive displacement rotary pumps	two-stage centrifugal pumps	explosion proof gear pumps	non-vented plunger pumps
642	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
643	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
644	Rapid fluctuation of the superheater outlet temperature can be caused by _____.	a dirty economizer	intermittent water carryover	excess air	dirty watersides
645	Rapidly discharging condensate into the DC heater during normal steaming conditions could cause _____.	decrease in auxiliary exhaust pressure	decrease in dissolved oxygen in the feed water	water hammer in the economizer	increase in auxiliary exhaust pressure
646	Reaching which 'end point' will result in the most severe damage to the boiler?	Circulation	Carryover	Combustion	Atomization
647	Reaching which of the boiler end points listed could cause the most damage to a boiler?	Combustion	Moisture carryover	Circulation	Heat transfer
648	Recirculation of the feed water ensures a flow of water through the _____.	main feed pump	economizer	standby feed pump suction line	third stage heater
649	Regarding the boiler shown in the illustration, the burners are to be placed at _____.	arrow "F"	arrow "K"	arrow "L"	none of the above
650	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
651	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
652	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
653	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
654	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 corrosion
655	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
656	Rows of tubes installed along the walls, floor, and roof of the furnace are called _____.	screen tubes	downcomers	water walls	water headers

ID #	Question	Choice A	Choice B	Choice C	Choice D
657	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	over pressurizing the valve body
658	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
659	Saltwater contamination of condensate could occur at which component?	DC heater	Aftercondenser	Fresh water evaporator	Intercondenser
660	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 feed water
661	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
662	Scale prevention in boiler water is accomplished by adding treatment chemicals to _____.	precipitate scale forming salts into sludge	solidify the scale as powder	increase boiler water acidity	cause the water to be neutral
663	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
664	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
665	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
666	Scavenging air lines are connected to boiler stack periscopes to _____.	keep the periscope tubing from warping	keep the mirrors from misaligning	maintain a negative pressure in the periscope line	prevent stack gases from contaminating the periscopes internal components
667	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
668	Sediment in fuel oil will cause _____.	sputtering of atomizers	panting in the furnace	excessive white smoke	clogged atomizer tips
669	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
670	Serious tube leaks in the air ejector after condenser assembly may cause _____.	clogged steam strainers	fouled nozzles	an overflow of the contaminated drain inspection tank	an overflow of the atmospheric drain tank
671	Serious tube leaks in the air ejector condenser assembly may cause _____.	clogged steam strainers	high salinity content	an overflow of the contaminated drain inspection tank	an overflow of the atmospheric drain tank
672	Serious tube leaks in the air ejector condenser assembly will cause _____.	clogged steam strainers	fouled nozzles	loss of vacuum	faulty steam pressure
673	Severe priming in a boiler can cause damage to the _____.	superheater	steam drum internals	feed water regulating valve	control desuperheater
674	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
675	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
676	Should the superheater outlet thermometer indicate an excessively high temperature on a single furnace boiler, the cause could be _____.	dirty steam generating tube surfaces	too much excess air	the fuel oil being too viscous	all of the above
677	Single-element automatic feed water regulators are controlled by the _____.	temperature in the steam drum	water level in the steam drum	pressure in the steam drum	feed water flow to steam drum
678	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
679	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
680	Slagging of boiler furnaces is a slow progressive action which is accelerated by _____.	fuel oils having high ash content	low firing rates	prolonged feed water contamination of fuel oil	burning diesel fuel
681	Sodium sulfite is added to boiler water to chemically react with any _____.	dissolved oxygen present in the water	dissolved carbon dioxide present in the water	potassium phosphate present in the water	phenolphthalein present in the water
682	Sound is produced by the illustrated device by the _____.	vertical vibrating movement of "E"	high speed rotation of "B"	rapid oscillation of "B"	rapid input of steam or air through "F"
683	Spray atomizers are commonly used to _____.	deerate condensate	reduce steam temperatures	cool the intercondenser	aerate makeup distillate

ID #	Question	Choice A	Choice B	Choice C	Choice D
684	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
685	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
686	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
687	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
688	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
689	Steam drains from fuel oil heating coils can be returned to the condensate and feed water 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
690	Steam drains from the potable water system hot water heater would be collected in the _____.	deaerating feed water heater	contaminated drain inspection tank	gland exhaust condenser	first stage heater
691	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
692	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
693	Steam leaving the desuperheater is used to _____.	operate the ship service turbo generator	operate auxiliary equipment	supply additional steam for propulsion during overload conditions	provide steam for propulsion during low speed operation
694	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
695	Steam soot blower piping should be thoroughly drained before operating to prevent _____.	accidental burner flameout	condensate and feed water contamination	water hammer damage and nozzle/element erosion	overheating the economizer
696	Strainers are installed in boiler fuel oil service lines to _____.	absorb contaminants	remove solids	decrease viscosity	adsorb water

ID #	Question	Choice A	Choice B	Choice C	Choice D
697	Strainers are installed in boiler fuel oil service lines to _____.	collect water	remove solids	decrease viscosity	absorb contaminants
698	Strainers are installed in boiler fuel oil service lines to _____.	absorb contaminants	collect water	decrease viscosity	remove solids
699	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
700	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
701	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
702	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	dissolved salts from sea contamination
703	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
704	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"
705	The absence of carbon monoxide in the flue gas of a boiler indicates _____.	efficient combustion	insufficient air	contaminated fuel oil	low carbon content of fuel
706	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
707	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
708	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
709	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
710	The amount of sodium phosphate in treated boiler water can be measured by a/an _____.	alkalinity test	phosphate test	chloride test	sodium phosphorous test
711	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
712	The atmospheric drain tank (ADT) normally drains to the _____.	main and/or auxiliary condenser	reserve feed tanks	main and/or auxiliary air ejector condenser	distillate tank
713	The automatic recirculating valve in the main condensate recirculating line is controlled by a temperature sensor which is located at the _____.	air ejector condensate discharge	main condensate pump discharge	condensate inlet to the main air ejectors	main condensate pump suction
714	The automatic recirculating valve in the main condensate recirculating line is designed to be controlled by which method?	Thermostatic control	Main condenser salt water pressure controller	Exhaust steam pressure controller	Preset electric timing device
715	The auxiliary exhaust system shown in the illustration can be supplied by steam from the _____.	turbo generators	IP bleed system	LP bleed system	distilling plant
716	The best conductor of heat in a marine boiler is _____.	steel	water	steam	brick
717	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
718	The boiler economizer provides additional heat to the _____.	fuel oil entering the furnace	air supply entering the furnace	steam leaving the superheater	feed water entering the boiler
719	The boiler feed water control valve varies the unity relationship between steam and water flow during periods of _____.	minimum boiler load	steady boiler load	overload operation	load change
720	The boiler fuel oil service pump normally takes suction from the _____.	fuel oil heater discharge	fuel oil settler tank high suction	fuel oil settler tank low suction	fuel oil storage tanks
721	The boiler fuel oil service pump normally takes suction from the _____.	fuel oil heater discharge	contaminated drain inspection tank	fuel oil settler tank	double bottom fuel tanks
722	The boiler fuel oil system 'hot' strainers are also known as _____.	coarse strainers	magnetic strainers	discharge strainers	cestus strainers
723	The boiler fuel oil system suction strainers are also known as the _____.	'cold' strainer	'hot' strainer	'fine' strainer	magnetic strainer
724	The boiler gage glasses should be periodically blown down to _____.	test the feed water stop-check valve	provide accurate water samples for the second assistant	maintain the proper water level in the steam drum	remove any sediment buildup in the gage glass
725	The boiler main feed pump aboard ship can operate with 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	minimum required net positive suction pressure is provided by the DC heater

ID #	Question	Choice A	Choice B	Choice C	Choice D
726	The boiler main feed stop check valve is located nearest the _____.	DC heater feed water outlet	first stage feed water heater outlet	boiler water drum inlet	main feed water regulator inlet
727	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
728	The boiler shown in the illustration has its screen tubes connecting the steam drum and the component label '_____'. I		G	F	D
729	The boiler shown in the illustration, arrow "O" indicates the _____.	main generating tubes	superheater tubes	screen tubes	soot blower elements
730	The boiler superheater shown in the illustration is a/an _____.	horizontal U-type	overdeck convection-type	vertical U-type	overdeck integral-type
731	The boiler superheater vent, shown in the illustration, is connected to the part labeled '_____'. C		M	D	J
732	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
733	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 feed water supply and immediately _____.	reduce the firing rate of the boiler	secure the forced draft fans	secure the fires and secure the feed water when the level falls out of sight in the gage glass	gag the drum safety valves to prevent loss of steam
734	The boiler wrapper sheet, shown in the illustration, is indicated by arrow _____.	A	B	H	I
735	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
736	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
737	The BTU value of fuel oil is determined by a/an _____.	open cup test	calorimeter	hydrometer	viscosimeter
738	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
739	The Butterworth heater (tank cleaning heater) shown in the illustration is designed to operate at a nominal steam pressure of approximately _____.	130 psi	240 psi	450 psi	850 psi
740	The Butterworth heater shown in the illustration receives steam at approximately _____.	130 psi	170 psi	205 psi	850 psi

ID #	Question	Choice A	Choice B	Choice C	Choice D
741	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
742	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
743	The component lettered "J" shown in the illustration serves as a _____.	water drum	support beam	side water wall header	screen tube header
744	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
745	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
746	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
747	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 blow down
748	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
749	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
750	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
751	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
752	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
753	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
754	The control desuperheater of most boilers functions to control _____.	superheated steam flow	desuperheated steam temperature	superheater inlet temperature	superheated steam temperature
755	The cooling water flow from an air ejector intercondenser and aftercondenser is discharged directly into the _____.	main condenser hot well	auxiliary condenser hot well	condensate and feed system	atmospheric drain tank
756	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
757	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 hot well	recirculate condensate to the atmospheric drain tank	drain excess feed water to the distilled water tank
758	The DC Heater functions to _____.	store, heat, and deaerate feed water	chemically treat feed water to remove carbonic gas	ensure recirculation in the feed water system	remove the major amount of non-condensable gases from the main condenser
759	The DC heater functions to _____.	remove air from feed water	heat feed water	store feed water	all of the above
760	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 and oil viscosity
761	The depth of fuel oil in a double bottom tank is measured through the _____.	vent line	depth gage	manhole cover	sounding tube
762	The designed 'end point for combustion' for a boiler furnace is reached when _____.	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 the boiler can generate steam is reached	the boiler is operating at its maximum fuel oil firing rate
763	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
764	The device shown in the illustration is a/an _____.	air ejector	deaerator	desuperheater	eductor

ID #	Question	Choice A	Choice B	Choice C	Choice D
765	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
766	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
767	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
768	The differential temperature of the main condenser cooling water will be significantly affected by a change in _____.	sea temperature	condensate pump pressure	volume of cooling water flow	boiler feed pump pressure
769	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
770	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
771	The distance piece in a boiler burner register assembly, provides for adjustment of the _____.	burner throat opening to attain the desired amount of secondary air flow	diffuser position with relation to the atomizer tip	fuel oil flame cone angle	total volume of air admitted through the register
772	The downcomer tubes installed in modern water tube 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
773	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 feed water regulator
774	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
775	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
776	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 blow down	waterside corrosion treatment
777	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 blow down	waterside corrosion treatment
778	The entire unit which houses the burner, air scoop, air doors and bladed cone is correctly called the _____.	burner assembly	register assembly	atomizer assembly	air duct assembly
779	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
780	The feed water heater shown in the illustration was designed to maintain the required feed water 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	feed water outlet temperature will decrease	flow rate of condensate to the feed heater will increase
781	The feed water heater shown in the illustration was designed to maintain the required feed water 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	feed water outlet temperature will increase
782	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
783	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 feed water regulating valve sensing line from the top of the steam drum
784	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
785	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
786	The first and second stage air ejectors used with main steam condensers are designed to _____. I. establish vacuum II. increase condensate temperature	I only	II only	Both I and II	Neither I nor II
787	The fittings labeled "P" shown in the illustration are known as the _____.	main steam stops	main steam outlets	desuperheater outlets	safety valve nozzles
788	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
789	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
790	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
791	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
792	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
793	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
794	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
795	The function of downcomers installed in water-tube boilers is to _____.	accelerate of water circulation	decrease the end point for moisture carryover	distribute feed water within the drum	decrease the rate of steam generation

ID #	Question	Choice A	Choice B	Choice C	Choice D
796	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 "L" as part of the process to produce sound
797	The generating tubes in an operating boiler will overheat and possibly fail when the boiler reaches the end point of _____.	evaporation	generation	combustion	circulation
798	The gland exhaust fan draws steam and non-condensable vapors from the gland exhaust condenser and discharges to the _____.	atmospheric drain tank	atmosphere	main condenser	vent condenser
799	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
800	The greatest deterrent to heat transfer from the fireside to the waterside of a boiler is _____.	water film	water eddies	gas film	gas eddies
801	The greatest heat loss in an oil fired boiler is from _____.	conduction through tube metals	radiation through the furnace casing	combustion gases leaving the stack	incomplete fuel oil combustion
802	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
803	The greatest single overall loss of efficiency in a marine propulsion steam plant cycle results from _____.	heat lost in the main condenser	poor heat transfer in feed water heaters	mechanical losses in the atomization process	heat loss required for fuel oil heating
804	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
805	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
806	The illustrated device is designed as a _____.	water and steam separator	oil and water separator	liquid eductor	steam whistle
807	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
808	The internal feed pipe in a D-type marine boiler _____.	distributes feed water evenly throughout the steam drum	guides the feed water toward the downcomer tubes	is located well above the normal steam drum water level to assist in deaeration of feed water	is drilled with holes to provide even distribution of boiler feed water chemicals

ID #	Question	Choice A	Choice B	Choice C	Choice D
809	The internal feed pipe in a D-type marine boiler provides _____.	distribution of feed water evenly throughout the steam drum	guidance of the feed water towards the downcomers as it enters the water drum	cooling for the internal cyclone separators	cooling for the superheater tube bank
810	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
811	The internal feed pipe of a power boiler distributes the feed water into the _____.	mud drum	water drum	steam drum	economizer
812	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
813	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
814	The items labeled "C" and "L" as indicated on the illustration are commonly called _____.	mica sheets	face plates	cork gaskets	glass plate inserts
815	The items labeled "D" and "M" as indicated on the illustration are commonly called _____.	mica sheets	face plates	cork gaskets	glass inserts
816	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
817	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
818	The leakage of air 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
819	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
820	The level in the atmospheric drain tank when underway at sea, is normally maintained by the use of a/an _____.	overflow to the bilge drain tank	float-type regulator draining to the main condenser	vacuum drag to the air ejector condenser	overflow to a distillate tank
821	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
822	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
823	The loop seal connected to the main condenser returns the drains from the _____.	vent condenser	intercondenser	aftercondenser	all of the above

ID #	Question	Choice A	Choice B	Choice C	Choice D
824	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
825	The main boiler feed pump discharge is controlled by the admission of steam to the auxiliary turbine. The admission of steam is normally regulated by a _____.	flyweight controlled regulating valve	multi nozzle arrangement	constant speed limiting governor	constant pump discharge pressure governor
826	The main condensate pump in a steam propulsion plant discharges directly to the _____.	air ejector intercondenser	main condenser hot well	air ejector aftercondenser	DC heater vent condenser
827	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
828	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
829	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
830	The main purpose of the boiler steam drum component shown in the illustration is to _____.	permit expansion during pressure surges	prevent thermal shock	reduce vibration	reduce the possibility of priming
831	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
832	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
833	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
834	The main steam stop valve on a "D" type marine boiler is located at the _____.	desuperheater outlet	desuperheater inlet	superheater outlet	superheater inlet
835	The major heat loss in a marine boiler is from the heat _____.	used in the economizer and air heater	passing through the boiler casing	of combustion gases leaving the stack	required to change water into steam

ID #	Question	Choice A	Choice B	Choice C	Choice D
836	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
837	The major reason dissolved gases are removed from boiler feed water is because they may cause _____.	condenser vacuum loss	corrosive conditions in the boiler	a false boiler water level	vapor lock in the feed pumps
838	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, the minimum settings of the drum safety valves allowed by Coast Guard Regulations would be _____.	825 psi	850 psi	875 psi	900 psi
839	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)
840	The means of circulation commonly found in water-tube boilers is _____.	compound	accelerated natural	cross-compound	integral
841	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
842	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
843	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 feed pump	maximum condensate pump discharge pressure	desuperheater outlet temperature
844	The minimum feed water 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
845	The minimum temperature requirements for fuel oil in storage tanks is related to the _____.	fire point of the oil	pumpability of the oil	size of the containment area in case of overflow	size of the vents
846	The most common cause of abnormal fireside burning of the boiler superheater tubes can "indirectly" be the result of _____.	combustion gases impinging on the tubes	fuel droplets striking the hot tubes	excessive boiler water carryover	the tubes being subjected to excessive vibration
847	The MOST common cause of heat blisters developing on boiler generating tubes is due to _____.	waterside deposits	flame impingement	gas laning	insufficient water circulation
848	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
849	The most harmful slag forming compounds found in fuel oils are _____.	iron and sulphur	vanadium and sodium	potassium and nickel	calcium and silica

ID #	Question	Choice A	Choice B	Choice C	Choice D
850	The most important consideration to take into account when water washing the firesides of a water tube boiler is _____.	the corrosive effects of sulfuric acid	the rusting of boiler tubes	possible damage to the outer casing	possible damage to the smoke periscope
851	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
852	The most serious fireside burning of the boiler superheater tubes can be INDIRECTLY attributed to _____.	combustion gases impinging on the tubes	fuel droplets striking the hot tubes	excessive boiler water carryover	the tubes being subjected to excessive vibration
853	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
854	The most troublesome corrosive substances in boiler water are oxygen and _____.	hydrogen sulfide	sulfur dioxide	carbon dioxide	ammonia
855	The net positive suction head of a boiler centrifugal feed pump should be calculated over and above the _____.	feed water vapor pressure	speed of the impeller	pump capacity in gpm	impeller ratio of the pump
856	The net positive suction head of a boiler centrifugal feed pump should be calculated to include the feed water vapor pressure and the _____.	impeller ratio of the pump	speed of the impeller	pump capacity in gpm	height of the DC heater
857	The number '29' on a fuel oil burner sprayer plate marked '2909' indicates the _____.	orifice size	cross-sectional area ratio	whirling chamber size	slot cross-sectional area
858	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
859	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
860	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
861	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
862	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
863	The phrase 'boiler water column' as defined in the regulations, refers to the _____.	water level indicator	vertical water leg	pressure head to the feed water pump suction	pressure gauge reading in feet of water

ID #	Question	Choice A	Choice B	Choice C	Choice D
864	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
865	The plugging of an excessive number of superheater tubes will result in _____.	high superheater outlet temperature	low superheater outlet temperature	high boiler water level	lower stack temperatures
866	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
867	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
868	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
869	The pressure in the feed water system must exceed boiler steam drum pressure in order to _____.	prevent water hammer in the lines	prevent air leakage into the feed water system	force the feed water into the boiler	remove the steam from the steam drum
870	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 non-adherent 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
871	The primary function of the contaminated drain inspection tank is to _____.	provide a source of make-up feed	provide a means to preheat auxiliary condensate	provide a means to cool down contaminated drains	serve as a means for visually examining steam condensate drains which may contain oil
872	The primary objective of the auxiliary exhaust system is to supply steam to the _____.	main condenser	main feed pumps	deaerating feed tank	soot blowers
873	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 blow down is accomplished	difference in valve relieving capacities	manner in which lifting pressure is adjusted
874	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
875	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
876	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
877	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
878	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
879	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
880	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
881	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, swirling, uniform fuel mist	prevent primary air mixing with the fuel
882	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
883	The principal means of increasing the amount of blow down 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
884	The process of breaking up fuel oil into fine particles to ensure good combustion is called _____.	settling	straining	pumping	atomization
885	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
886	The property of a fuel oil which is a measurement of its available energy, is known as its _____.	cetane number	heating value	viscosity index	cetane index
887	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
888	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 feed water	distill makeup feed for use as potable water	ensure an uncontaminated source of feed for the makeup evaporator
889	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
890	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
891	The purpose of firebrick in a water tube boiler furnace is to _____. I. protect the generating tubes from flame impingement II. protect the boiler furnace inner casing	I only	II only	Both I and II	Neither I nor II
892	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
893	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
894	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
895	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
896	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
897	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
898	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
899	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
900	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 the soot blower element	control the amount of arc during rotation of the soot blower element	assist in the initial opening of the valve at the beginning of the soot blower operation
901	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 soot blower element	control the pressure exerted on the valve spring retainer	increase the pressure in the steam supply line for proper soot blower operation
902	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
903	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
904	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
905	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
906	The purpose of the steam control valves installed in the auxiliary exhaust line is to _____.	control steam admission and maintain the proper steam spray pattern in the DC heater	regulate back pressure in the desuperheater line	preheat the condensate before it enters the vent condenser	seal the vent condenser to prevent the escape of condensate
907	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
908	The rate of fouling on the oil side of fuel oil heaters is directly related to the _____.	steam pressure in the heater	shape of the heating coils in the heater	oil pressure in the heater	rate of oil flow through the heater
909	The rate of fouling on the oil side of fuel oil heaters is mostly affected by 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
910	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
911	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
912	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
913	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
914	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
915	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
916	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 fire room	full power capacity of each boiler

ID #	Question	Choice A	Choice B	Choice C	Choice D
917	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
918	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
919	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
920	The scavenging air for soot blowers is supplied by the _____.	low pressure air compressor	forced draft blowers	control air regulator	all of the above
921	The screen tubes shown in the illustration are indicated by arrow '_____.'	F	J	H	D
922	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
923	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
924	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 feed water
925	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
926	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
927	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
928	The steam soot blower piping should be thoroughly drained before operating to prevent _____.	impinging of generating tube surfaces	feed water losses	plugging of nozzles	warping of soot blower elements
929	The steam soot blower piping should be thoroughly drained before operating to prevent _____.	accidental flameout	feed water losses	nozzle/elements eroding	erosion of the corbel
930	The steam soot blower piping should be thoroughly drained before operating to prevent _____.	accidental flameout	feed water losses	nozzle plugging	erosion of refractory
931	The superheater vents should always be open when _____.	blowing down the boiler	blowing tubes	lighting off the boiler	the water level is lower than normal
932	The temperature of steam at the superheater outlet is influenced by the _____.	temperature of the feed water	amount of excess air	amount of moisture contained in the steam	all of the above
933	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
934	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
935	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
936	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
937	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
938	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
939	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.
940	The tube sheet shown in the illustration is indicated by the letter '_____'. _____.	A	B	I	K
941	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
942	The turbo generator 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 turbo generators	provide a flow of cooling steam through the control desuperheater	allow the use of superheated steam in the turbo generator without pressurizing the larger main steam line
943	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 feed water 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
944	The two common chemicals which are the primary cause of internal boiler corrosion are _____.	carbon monoxide and sodium sulfite	dissolved oxygen and hydroxyl ions	phosphates and chromates	chromates and hydrazines
945	The two most common causes of boiler corrosion attributable to boiler water are dissolved oxygen and _____.	carbon monoxide	hydroxyl ions	ammonia	nitrogen
946	The two-element feed water regulator functions similarly to the three-element feed water regulator, but does not utilize _____.	steam flow measurement	feed water flow measurement	water level	drum pressure
947	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
948	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
949	The useful life of furnace refractory is affected most by _____.	the quality of the fuel being burned	improper treatment of boiler water	high steady steaming boiler loads	large and rapid changes in furnace temperature

ID #	Question	Choice A	Choice B	Choice C	Choice D
950	The vacuum drag line for the main condenser is specifically connected in which area?	main tube bank	the steams first point of entry	the end of the steam lane	lower portion of the hot well
951	The valve located between the fuel oil header and the burner valve is known as the _____.	root valve	return valve	header valve	register valve
952	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
953	The vent line from the main condenser 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
954	The vent line from the main condenser 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
955	The viscosity of a residual fuel oil is measured in Saybolt _____.	Milliliters Universal	Millimeters Universal	Seconds Furol	Minutes Universal
956	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 and open the bottom blow valve	reduce the feed water flow to the boiler	secure the feed water flow to the boiler	open the surface blow line
957	Thin sheets of mica are installed in boiler gage glasses to _____.	reduce the possibility of the glass from becoming etched	limit the possibility of glass being blown out into the fire room	lower the conductivity of the water in the glass	prevent gasket leakage
958	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
959	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
960	To adjust the amount of safety valve blow down, as shown in the illustration, you would reposition the part indicated by arrow '_____.'	A	B	C	D
961	To allow for water drum expansion and contraction, most main propulsion boilers are fitted with _____.	U-bend tubes	expansion joints	sliding feet	spring supported pipe hangers
962	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
963	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
964	To change the amount of blow down of the safety valve shown in the illustration, you must change the position of the _____.	feather guide	adjusting ring	compression screw	huddling chamber
965	To change the lifting pressure of the safety valve shown in the illustration, you must readjust the part labeled _____.	A	B	C	D
966	To combat galvanic corrosion, condensers utilizing copper-nickel waterboxes are usually fitted with _____.	bonding straps	zinc anodes	protective coatings	all of the above
967	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
968	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.
969	To increase the blow down of a nozzle reaction safety valve, _____.	lower the nozzle ring	raise the blow down ring	lower the adjusting ring	raise the blow down ring and then lower the nozzle ring
970	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
971	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
972	To minimize metal corrosion, boiler water is best kept _____.	fairly acidic	slightly acidic	neutral	alkaline

ID #	Question	Choice A	Choice B	Choice C	Choice D
973	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
974	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
975	To prevent pulsations from developing in the boiler feed water lines, the discharge side of a reciprocating feed pump is equipped with a/an _____.	feed water regulator	air chamber	relief valve	reed valve
976	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
977	To properly blow down 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 cut out valves	take up snugly on upper and lower gage glass packing nuts prior to blowing down
978	To properly clean a burner tip, you should use _____.	light sand blast grit	a soft metal tool	a jack knife	a wire brush
979	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
980	To provide emergency feed water supply to a steaming boiler and 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
981	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
982	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
983	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
984	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
985	Treatment of boiler feed water for the control of hardness is necessary to prevent _____.	excessive feed water alkalinity	foaming	carryover	waterside scale deposits

ID #	Question	Choice A	Choice B	Choice C	Choice D
986	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%
987	Two-element feed water regulators operate by sensing _____.	boiler water level and steam flow	boiler water level and steam pressure	boiler water level and feed water flow	feed water flow and steam pressure
988	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
989	Under constant boiler load, the superheated steam temperature may rise above normal for the existing load if _____.	excess air is too low	feed water temperature is too low	boiler water level is too high	combustion air is excessively hot
990	Under EMERGENCY operating conditions, the proper valve positions for controlling feed water 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 feed water regulator
991	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
992	Under normal conditions, the rate of heat transfer in a feed water heater is most greatly affected by the _____.	temperature differential between the steam and feed water	density of the feed water	pH of the feed water	speed of the main feed pump
993	Under normal firing rates, a reduction of the steam outlet temperature from an uncontrolled superheater could be caused by _____.	high feed water temperature	too much excess air	dirty generating tubes	fouled economizer tubes
994	Under normal firing rates, which of the conditions listed could result in a low superheater outlet temperature?	High feed water temperature	Too much excess air	Dirty generating tubes	Fouled economizer tubes
995	Under normal operating conditions of constant load and combustion rates, which of the following will occur when the amount of excess air to the furnace is increased?	The superheater inlet temperature will decrease.	The rate of heat transfer will decrease.	The superheater inlet temperature will increase.	The superheater outlet temperature will increase.
996	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 feed water temperature	combustion gas velocity through the superheater	the pressure differential across the fuel oil strainers

ID #	Question	Choice A	Choice B	Choice C	Choice D
997	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
998	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 feed water temperature	badly fouled economizer
999	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 feed water temperature	badly fouled economizer
1000	Under otherwise normal steaming conditions, an abnormally high temperature at the superheater outlet of a single furnace boiler would indicate _____.	poor heat transfer in feed water heaters	high steam demand	insufficient combustion air	excessive steam supply to fuel oil heaters
1001	Under steady steaming conditions, the superheater outlet temperature is regulated by the _____.	integral superheater	control desuperheater	auxiliary desuperheater	radiant superheater
1002	Under what operating conditions may water wall header drains be used for blow down?	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.
1003	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
1004	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
1005	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
1006	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 non-condensable gases	the gases liberated by the deaeration process
1007	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
1008	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1009	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
1010	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
1011	Water circulation in a water-tube boiler is a result of the _____.	difference between the area and length of the water-tubes	differences in water density in boiler tubes	velocity added to the water by the feed pump	siphon action of steam leaving the drum
1012	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
1013	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
1014	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
1015	Waterboxes on condensers are vented to _____.	prevent excessive pressure on tube sheets	liberate air pockets and reduce waterside oxidation	assure positive flow to the lube oil coolers	prevent vapor binding of the circulating pump
1016	Waterboxes on main condensers are vented to _____.	prevent excessive pressure on tube sheets	liberate air pockets and reduce waterside oxidation	provide a minimum condensate level in the hot well	prevent vapor binding of the circulating pump
1017	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
1018	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
1019	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
1020	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
1021	What affect will the emergency plugging of leaking condenser tubes have on the condenser pressure and hot well temperature when returning to normal steam plant sea speed operation?	Absolute pressure and hot well temperature will increase	Absolute pressure will decrease and hot well temperature will increase	Absolute pressure will increase and hot well temperature will decrease	Absolute pressure and hot well temperature will decrease

ID #	Question	Choice A	Choice B	Choice C	Choice D
1022	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
1023	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.
1024	What boiler water test would be given to insure that the boiler water contains sufficient chemicals to transform hard scale forming salts into harmless sludge which would eventually be removed with blow downs?	alkalinity test	phosphate test	chloride test	hydrazine test
1025	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
1026	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.
1027	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.
1028	What is the cause of 'laning' in a boiler tube bank?	Insufficient airflow	Slag accumulation forming between the tubes	Low fuel oil pressure	High fuel oil temperature
1029	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
1030	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.
1031	What is the main constituent in fuel oil which determines its heat value?	Hydrocarbons	Oxygen	Nitrogen	Sulphur
1032	What is the primary function of the water screen tubes in a "D" type marine boiler?	Generate the major portion of the steam in the boiler.	Increase the temperature of the generating tube bank.	Provide a steady supply of water to the water drum.	Protect the superheater tubes from the radiant heat of the flames in the furnace.
1033	What is the primary operational difference between a nozzle reaction safety valve and a huddling chamber safety valve?	The principle by which blow down 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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1034	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.
1035	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.
1036	What is the quickest way to shutoff the boiler fuel oil supply from inside the fire room?	Closing the settling tank suction valves.	Trip the quick-closing fuel valve.	Close the double bottom suction valves.	Open the oil recirculating valves.
1037	What percentage of CO2 in a boiler flue gas analysis would indicate perfect combustion?	0%	3%	6%	12%
1038	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 its 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.
1039	What type of boiler is shown in the illustration?	A down fired 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, D type boiler with an interdeck superheater, an economizer, water walls and downcomers.	A sectional header boiler with a superheater, economizer, and water walls and downcomers.
1040	What type of boiler superheater is shown in the illustration?	Overdeck convection tube	Vertical U-tube	Overdeck integral tube	Horizontal U-tube
1041	What type of sensor is normally used with the automatic recirculating valve in the main condensate line?	Thermostatic	Pressure	Continuity	Preset electric timing sensor
1042	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
1043	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.
1044	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 on the superheater outlet.	A stop check valve is to be located at the economizer outlet.	A stop check valve is to be located at the economizer inlet.	An emergency drain line must be provided to the reserve feed tank.
1045	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1046	When a boiler has been secured and is being initially 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
1047	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
1048	When a boiler water test indicates a pH value of 6, you should _____.	check the DC heater for possible malfunction	begin a continuous boiler blow down	chemically treat to lower the pH to normal level	chemically treat to raise the pH to normal level
1049	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
1050	When a propulsion boiler is removed from service for an extended period, why should the firesides be thoroughly dried after water washing?	Reduce the probability of corrosion.	Prevent flarebacks on lighting off.	Prevent cracking of the brickwork.	Reduce the possibility of thermal spalling.
1051	When a soot fire occurs, damage to an economizer can be minimized if you _____.	maintain feed water 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
1052	When a vessel is in port and the boiler automation system continually trips the burner fuel oil solenoid valve, 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	change the burner and check the flame safeguard system	wedge the valve in the open position and reduce the fuel oil pressure at that burner
1053	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
1054	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
1055	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1056	When burning fuel oil in a boiler, a high CO ₂ 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 CO ₂ 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
1057	When cleaning the waterside of boiler tubes with a powered rotary brush, the brush should kept in motion to _____.	avoid internal tube damage	prevent it from seizing	reduce tube pitting	reduce wear to brush bristles
1058	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
1059	When conducting a periodic hydrostatic test of a boiler, Coast Guard Regulations (46 CFR Part 61) 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
1060	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
1061	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
1062	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
1063	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1064	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
1065	When heated, brickwork in a boiler is kept from buckling by the installation of _____.	insulating bricks	sliding saddles	expansion joints	insulating blocks
1066	When heated, fuel oil will _____.	increase in specific gravity	have a higher specific heat	expand in volume	increase in viscosity
1067	When heating heavy fuel oil for use 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
1068	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 feed water flow.	Decreasing the steam pressure.
1069	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
1070	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
1071	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.
1072	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
1073	When manually firing a main propulsion boiler, an increase in boiler load should 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
1074	When operating under constant load, the superheated steam temperature may rise above normal if the _____.	excess air is too low	feed water temperature is too low	feed water temperature is too high	boiler is priming

ID #	Question	Choice A	Choice B	Choice C	Choice D
1075	When operating with the auxiliary feed line, feed water flow is controlled _____.	manually by throttling the auxiliary feed stop-check valve	automatically by the main feed water regulator	manually by adjustment of the auxiliary feed water regulator spring setting	automatically by the economizer bypass
1076	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
1077	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 desuperheated steam stop.	Test the hand relieving gear.
1078	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)
1079	When preparing to light off a cold boiler, the fuel oil should be recirculated until it is _____.	heated sufficiently for proper atomization	thoroughly cleaned by the fuel oil strainers	viscous enough for rapid pumping	entrained with air bubbles
1080	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
1081	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
1082	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
1083	When raising steam on an idle boiler and the steam pressure has risen to about 5 pounds more than the pressure of the boiler 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
1084	When raising vacuum on an auxiliary condenser, which of the following steps is necessary?	Close the makeup feed drag line to raise hot well 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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1085	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.
1086	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 reseal?	262 psig (1907 kPa)	273 psig (1983 kPa)	284 psig (2059 kPa)	295 psig (2135 kPa)
1087	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
1088	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
1089	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
1090	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.
1091	When starting a turbine driven boiler feed pump, care should be taken to insure that the recirculating valve is open. Which of the following valves should be closed when starting?	Pump discharge valve	Pump suction valve	Turbine steam supply valve	Turbine exhaust valve
1092	When testing boiler flue gas with a chemical absorption apparatus, to obtain accurate results _____.	prevent any air from contaminating the gas sample	analyze for nitrogen content before oxygen content	run each analysis for at least 3 minutes	purge the apparatus with air before use
1093	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
1094	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.	Manually control the fan discharge damper position.	Manually control the fan inlet damper position.
1095	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
1096	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1097	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.
1098	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
1099	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
1100	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
1101	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
1102	When vapor is in contact with and remains at the same temperature as the boiling liquid from which it was generated, the vapor and liquid are said to be in a/an _____.	latent contact	critical state	sensible contact	saturated condition
1103	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
1104	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
1105	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.
1106	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
1107	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
1108	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1109	When you are transferring fuel oil from one double bottom tank to another, 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
1110	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
1111	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
1112	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
1113	Where is the superheater located in the boiler shown in the illustration?	G	H	I	J
1114	Which action should be taken if the water level in the boiler gage glass drops out of sight and the burners fail to secure automatically?	Blow down the gage glass.	Trip the master solenoid.	Increase the feed pump speed.	Repair the feed water regulator.
1115	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.
1116	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
1117	Which atomizing sprayer plate has the largest capacity?	4309	2909	2 PCRS 3509	3009
1118	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
1119	Which color burner flame would indicate too much excess air?	Orange red	Yellowish orange	Bright red	Incandescent white
1120	Which combustible element in fuel oil is considered a significant and major source of air pollution?	Hydrogen	Nitrogen	Vanadium	Sulfur
1121	Which constituent of fuel oil determines the specific heat?	Hydrocarbons	Oxygen	Nitrogen	Sulphur

ID #	Question	Choice A	Choice B	Choice C	Choice D
1122	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
1123	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
1124	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
1125	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.
1126	Which of the boiler components listed receives feed water and serves as an area for the accumulation of saturated steam?	Steam drum	Headers	Water drum	Superheater headers
1127	Which of the boiler end points should be reached first?	Water circulation	Moisture carryover	Combustion	Atomization
1128	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
1129	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
1130	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
1131	Which of the condensers listed is cooled by sea water?	Air ejector condenser	Main condenser	Vent condenser	Gland exhaust condenser
1132	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.
1133	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.
1134	Which of the conditions listed could be the cause of chattering in a boiler safety valve?	Excessive spring tension.	Loose blow down ring.	Excessive blow down adjustment.	Scale in the escape piping.
1135	Which of the conditions listed could cause a boiler economizer to leak?	High feed water temperatures.	Low feed water pressure.	High stack gas temperatures.	Water hammer.
1136	Which of the conditions listed could cause steam formation in the economizer?	Excessive water flow rates.	Sudden large increase in the firing rate.	Soot buildup on the gill rings.	An open main feed pump recirculating line.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1137	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 hot well.	Operating the pump with a positive suction head.
1138	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 feed water.	Low back pressure in the auxiliary exhaust line.	Low water level continually maintained in the DC heater.
1139	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.
1140	Which of the conditions listed will provide 'blow down' 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 blow down period.
1141	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
1142	Which of the conditions listed would indicate excessive soot buildup on the economizer?	High feed water temperature entering the boiler	Low air temperature entering the boiler	High superheater temperature	Lower than usual air pressure in the furnace
1143	Which of the conditions will occur FIRST if the steam flow to the main engine, when at full power, is suddenly stopped?	Drum safety valve will open.	Dual element automatic feed water regulator will compensate for boiler water swell.	Superheater safety valve will open.	Combustion control system will automatically secure all of the burners.
1144	Which of the DC heater operations listed will result in excessive dissolved oxygen in boiler water?	Excessively high water level in the heater.	Adding excessive make up feed.	Operating the heater with a closed air vent.	All of the above.
1145	Which of the devices listed is indicated by arrow "H" shown in the illustration?	Economizer	Steam soot blowers	Overdeck superheater	Air heater
1146	Which of the devices listed is shown in the boiler illustration?	Retractable soot blower	Separately fired superheater	Regenerative air heater	Integral or interdeck superheater
1147	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
1148	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1149	Which of the flue gas components listed contributes to the greatest heat loss in a boiler?	Carbon monoxide	Nitrogen	Carbon dioxide	Superheated water vapor
1150	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 feed pumps.
1151	Which of the following actions should be taken FIRST when the boiler fires begin to sputter due to water in the fuel oil?	Shift to the settler high suction valve.	Shift to the settler low suction valve.	Shift to the standby fuel oil heater.	Shift to the standby fuel oil pump.
1152	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 pneumerators.
1153	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.
1154	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.
1155	Which of the following best describes Boyle's law.	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.	A body in motion tends to remain in motion.
1156	Which of the following boiler stack (smoke color) conditions indicates efficient combustion?	Black haze	White haze	Brown haze	Yellow haze
1157	Which of the following chemicals is used in an Orsat apparatus to absorb carbon dioxide?	Cuprous chloride	Pyrogallic acid	Potassium hydroxide	Potassium chromate
1158	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
1159	Which of the following conditions is indicated by an external bulge or bowed area of the boiler furnace wall?	The furnace brickwork has collapsed in that area.	The brickwork has become slagged.	The insulation block has become slagged.	The corbels have failed.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1160	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.
1161	Which of the following conditions must exist before the superheating of saturated steam can occur in a steam propulsion boiler?	The firing rate of the boiler must be increased.	The flow of feed water to the boiler must be increased.	The steam must be directed to an area separate from the steam drum.	The economizer must be on line.
1162	Which of the following conditions will occur when a glassy film forms on the furnace wall due to the burning of fuel oil contaminated with salt water?	Formation of the protective coating will increase the overall life of the furnace refractory.	The average furnace temperature will increase.	The slagged sections will eventually peel off the surface of the wall.	Cracks will begin to occur in the furnace floor.
1163	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
1164	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
1165	Which of the following is the advantage of operating a typical closed feed water system for a marine boiler when compared to an open feed water system?	Reduced steam requirement for feed water heating.	Increased capability of removing and controlling dissolved oxygen.	Reduced requirement for condensate purity.	Allows for lower feed pump operating pressures.
1166	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.
1167	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
1168	Which of the following locations could desuperheated steam be considered to occur?	Spray attemperator	Main engine extractions	Both "A" and "B"	Neither "A" nor "B"
1169	Which of the following precautions should be observed when adding treatment chemicals to the boiler compound tank?	Cool the feed water 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.
1170	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1171	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.
1172	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.
1173	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
1174	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
1175	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
1176	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.
1177	Which of the following represents a significant system limitation to be aware of when a burner management system is operated in the "Manual" mode?	Some boiler safety interlocks are bypassed when the boiler is being fired in "Manual" mode.	The burner is not capable of maintaining a high firing rate when the boiler is in "Manual" mode.	The flame failure alarm cannot function when the boiler is in "Manual" mode.	The burner sequence control is fully automatic even in the "Manual" mode.
1178	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.
1179	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.	Feed water 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.
1180	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1181	Which of the following represents the proper color of the flame end farthest from the boiler burner during normal operations?	Bright yellow or orange	Dark brown	Light brown haze	Dazzling white
1182	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.
1183	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 blow down, 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.
1184	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 safety valve operates with a "huddling chamber" principle.	All of the above.
1185	Which of the following statements describes the effects that dissolved oxygen has on boiler internal surfaces with changes in temperature and pressure?	It decreases the corrosive effect when both pressure and temperature are increased.	It increases the corrosive effect with increased pressure and decreases its corrosive effect with increased temperature.	It increases the corrosive effect with lowered pressure and increases its corrosive effect with increased temperature.	Temperature and pressure have no effect on the corrosive effect of dissolved oxygen.
1186	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.
1187	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 feed water outlet.	The regulator controls the volume of condensate leaving the gland exhaust condenser.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1188	Which of the following statements is correct regarding the start-up operation of a non-condensing 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.
1189	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.
1190	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.
1191	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 gauged by drilling to determine the actual extent of deterioration.	If the thickness found as a result of gauging 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.
1192	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1193	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.
1194	Which of the following statements is true concerning the operation of a boiler thermo-hydraulic feed water 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.
1195	Which of the following statements is true concerning the operation of the automatic shut down solenoid valve in the fuel oil service 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 after a safety shutdown.	The valve will automatically reopen from a low water shutdown once water level is restored.	The valve will automatically close if boiler pressure drops 20% below normal working pressure
1196	Which of the following statements is true concerning the piping system shown in the illustration?	The boiler soot blowers operate with desuperheated steam.	Air ejectors operate on 143 psi steam.	The steam whistle operates on 140 psi steam.	All of the above.
1197	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 condensate and feed water system rather than the boiler water.	It removes free oxygen from the boiler without significantly increasing total dissolved solid content.	It aids in maintaining the pH of the boiler water within the prescribed limits.	All of the above.
1198	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.
1199	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.
1200	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1201	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.
1202	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.
1203	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.
1204	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.
1205	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.
1206	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.
1207	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.
1208	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1209	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.
1210	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
1211	Which of the following systems can normally be supplied by auxiliary exhaust steam?	Main feed pump	Low pressure evaporator	Air ejectors	Boiler steam atomizers
1212	Which of the following systems is designed to use auxiliary exhaust steam?	Steam fuel oil atomizers	Deaerating feed water heater	Air ejectors	Standby lube oil pumps
1213	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
1214	Which of the fuel atomizers listed has the greatest firing range or turndown ratio?	Steam assist	Rotary cup	Return flow	Straight-through flow
1215	Which of the items listed is required by Coast Guard Regulations (46 CFR Part 54) to be stamped on a pressure vessel?	Hydrostatic test pressure	Pneumatic test pressure	Coast Guard Symbol	Minimum wall thickness
1216	Which of the listed absorbing agents could be used in a boiler during a dry lay up period?	Sodium hydroxide	Sodium chloride	Deactivated hydrazine	Silica gel
1217	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.
1218	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
1219	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
1220	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1221	Which of the listed components would be considered the dividing line separating the condensate system from the feed water system?	Main condenser	Deaerating feed tank	Main air ejectors	Boiler drum
1222	Which of the listed conditions aids in directing gland leak off 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 exhaust fan.
1223	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.	Excessive air flow through the furnace
1224	Which of the listed conditions can cause 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.	Operating with a bypassed economizer.
1225	Which of the listed conditions causes shrinkage in boiler water levels?	Collapse of steam bubbles	Excessive steam bubbles	Sudden increase in feed water temperature	Sudden decrease of drum pressure
1226	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.
1227	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.
1228	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
1229	Which of the listed mediums should be used when water washing a boiler?	Heated freshwater	Cold freshwater	Heated saltwater	Cold saltwater
1230	Which of the listed mediums should be used when water washing a boiler?	Heated freshwater	Cold freshwater	Cold condensate	Warm condensate
1231	Which of the listed methods can be used to blow down a boiler without securing the fires?	Steam drum surface blow.	Bottom blow from the mud drum.	Blow down the rear water wall header.	Blow down the front water wall header.
1232	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.
1233	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.
1234	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1235	Which of the listed order of valves represents the proper installation of the main feed water supply line to a marine propulsion boiler?	Regulator, stop, stop-check	Stop-check, stop, regulator	Stop, regulator, stop-check	Stop-check, regulator, stop
1236	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.
1237	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
1238	Which of the listed refractory materials is capable of providing structural stability?	Chrome castable	Firebrick	Insulating brick	Insulating block
1239	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
1240	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
1241	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
1242	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
1243	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	Plastic chrome ore	Castable insulation	All of the above
1244	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.
1245	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
1246	Which of the listed tubes provides circulation to the water wall tubes?	Water screen tubes	Risers	Downcomers	Generating tubes
1247	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1248	Which of the listed types of strainers are installed between the fuel oil heater and the burner manifold?	Duplex	Magnetic	Simplex	Self-cleaning
1249	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.
1250	Which of the operating principles listed would apply to a single-element, thermo-hydraulic, feed water regulator?	A failure of the regulator pressure actuating system, such as from a leaky bellows, will tend to close the feed water valve.	The regulator is designed to always maintain a constant water level throughout the entire boiler load range.	The water side line leading to the inner tube is normally insulated.	The pressure in the inner tube acts upon the bellows of the regulator.
1251	Which of the operating principles listed would apply to a single-element, thermo-hydraulic, feed water 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.
1252	Which of the piping systems listed is shown in the illustration?	Auxiliary exhaust	Auxiliary steam	Butterworth	Main feed
1253	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.
1254	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.
1255	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.
1256	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
1257	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.
1258	Which of the pumps listed is normally used in fuel oil service systems?	Two-stage centrifugal	Positive displacement rotary	Explosion proof gear	Non-vented plunger
1259	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1260	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
1261	Which of the significant combustible elements of fuel oil is a major source of boiler corrosion?	Oxygen	Sulphur	Hydrogen	Carbon
1262	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.
1263	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.
1264	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.
1265	Which of the symbols shown in the illustration is used to identify a stop-check valve?	A	B	C	D
1266	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
1267	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
1268	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
1269	Which of the tools listed is used to remove a boiler tube from a header?	Swaging tool	Laminating tool	Backing out tool	Expanding tool
1270	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
1271	Which of the types of superheaters listed has the flattest superheat temperature curve?	Radiant	Convection	Radiant-convection	Conduction-convection
1272	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
1273	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1274	Which piping system is described in the illustration provided.	Main superheated steam system	Boiler feed and condensate system	Auxiliary desuperheated steam system	Turbine bleed steam system
1275	Which precaution should be observed 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.
1276	Which procedure should be followed to dry out the fireside of a boiler after water washing?	Place trays of silica gel in the furnace.	Alternately fire one burner 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.
1277	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
1278	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.
1279	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 feed water 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.
1280	Which statement is true concerning two-stage air ejector assemblies?	Air is removed from the condensate as it passes through the tubes.	Steam to the aftercondenser 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 air ejector to the intercondenser.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1281	Which statement listed represents a vital function of the main condenser?	The recovery of feed water for reuse.	Cooling of the exhaust steam from the auxiliary exhaust system before it enters the deaerating feed tank.	Storage of feed water for immediate use in the boilers.	Condensing of the exhaust steam from the main feed turbine pumps.
1282	Which symbol shown in the illustration is used to identify a stop-check valve on a drawing?	A	B	C	D
1283	Which system should be tested and used when required to raise the water level in an idle boiler?	Chemical feed system	Auxiliary feed system	Desuperheated steam system	Superheated steam system
1284	Which system should be used when required to raise the water level in an idle boiler?	Chemical feed system	Main feed system	Auxiliary condensate system	Main condensate system
1285	Which type of energy conversion is associated with an operating steam boiler?	Kinetic	Thermal	Mechanical	Specific
1286	Which type of feed water regulator listed provides the MOST effective regulation of boiler water level under all operating conditions?	Single-element	Double-element	Triple-element	Monothermonic
1287	Which type of waterside deposits can normally be removed by chemically boiling out a boiler?	Corrosion deposits	High temperature oxide	Oil	Sludge
1288	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 hot well 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
1289	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
1290	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
1291	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.
1292	While underway at sea, the feed water 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
1293	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
1294	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

ID #	Question	Choice A	Choice B	Choice C	Choice D
1295	While your vessel is steaming at a constant rate, the alkalinity in one of the boilers is decreasing steadily without requiring the use of extra makeup feed water. This condition could be caused by a leak in the _____.	economizer	condenser	desuperheater	superheater
1296	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.
1297	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 reseal 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
1298	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
1299	White stack smoke from a main propulsion boiler could indicate _____.	excessive amount of combustion air	low fuel temperature	insufficient air for combustion	excessive furnace combustion temperature
1300	Why are hard scale deposits on the inside of boiler tubes most objectionable?	Flow of water within the tube is restricted.	Poor heat transfer due to hard 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.
1301	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.
1302	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.
1303	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.
1304	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.

ID #	Question	Choice A	Choice B	Choice C	Choice D
1305	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
1306	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 drains to the main condenser.
1307	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.
1308	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.
1309	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.
1310	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
1311	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 feed water temperature was initially 104.5°C?	96.85 BTU	97.15 BTU	1016.40 BTU	1196.45 BTU
1312	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
1313	You can secure the fuel supply to the boilers from outside the fire room 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
1314	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 feed water stop-check valve
1315	Your vessel is steaming full ahead and operating on both boilers. If the boiler water level of one boiler drops out of sight low in the sight glass and the burners have been secured, besides slowing down the main engine, what further action should be taken?	close the main steam stop	manually feed the boiler to bring up the level	start the standby feed pump	blow down the gage glass

ID #	Question	Choice A	Choice B	Choice C	Choice D
1316	Zincs are installed in the main and auxiliary condenser waterboxes to _____.	reduce turbulence	prevent air pockets	reduce the effects of electrolysis	prevent scaling
End of Document					