

NIMASA MODEL QUESTIONS/ANSWERS
COURSE: MOTOR ENGINEERING KNOWLEDGE
FUNCTION: OOW (ENGINE) UNLIMITED
STUDY WITH MEF

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1. Which standards govern the specifications for supply of Residual Marine Fuels and Distillate Marine Fuels onboard merchant ships?

- A. ISO 3012:1999
- B. ISO 3648:1996
- C. ISO 8216-1:2010
- D. ISO 8217:2010**

2. Crank web deflection readings will give a positive indication of

- A. worn main bearing journals**
- B. torsional stress deformation
- C. slack thrust bearings
- D. bearing shells shim dimensions

3. ESD stands for which type of boiler

A. External superheater D-type

B. Emergency shutdown Boiler

C. Extreme Superheat type

D. External Superheat De-superheater type

4. The advantage of tie rods over an engine without tie rods is that:

A. The engine is very easily aligned after any misalignment has taken place between different components of the engine

B. The engine doesn't require thrust pads for transmission of thrust to the ship's hull as the same is being taken care of by the tie rods

C. The engine components are much lighter leading in overall reduction in engine weight with a high power generation with the elimination of fatigue stresses

D. There are no advantages of engines with tie rods, because tie rods require regular maintenance and replacement like connecting rods and overall engine becomes more expensive to operate

5. Which of the following is an example of a solid bearing?

A. Piston pin bushing

B. Turbo-generator turbine bearing

C. Spring bearing

D. Thrust bearing

6. In order for microbiological growths to thrive in a fuel tank it is necessary for

A. high temperatures to exist

B. low temperatures to exist

C. small amounts of water to be present

D. large amounts of water to be present

7. Marine boilers burning H.F.O. face a problem of cold corrosion due to high sulphur content. The minimum flue gas temperature within any boiler part is kept above dew point of H₂SO₄. The actual dew point of H₂SO₄ in flue gases depends on the:

A. Boiler furnace temperature

B. Ambient air temperature

C. Boiler operating pressure

D. HFO sulphur content and moisture in combustion air

8. The purpose of an air cooler in a supercharging system is to:

A. Reduce temperature of supercharged air in order to condense and remove maximum possible moisture from the air prior entry to the engine

B. Reduce the temperature of the supercharged air in order to increase the density & also to cool down below dew point to remove moisture from air prior entry to the engine

C. Cool supercharged air to increase its density such that the dew point is not reached to avoid entry of moisture into the engine

D. Cool supercharged air to increase its density and also to keep the peak temperature and exhaust gas temperature within limits

9. Use of Halon as fire extinguishing medium has been discontinued because

A. It is highly toxic

B. It is expensive

C. It has high Ozone depleting potential

D. It leads to acid rains

10. In comparison to exhaust valves, intake valves of diesel engines may be fabricated from low-alloy steels because

A. the beveled edges of the intake valves provide for self-centering during seating

B. intake valves utilize stellite-coated valve seat inserts which reduce wear

C. the volume of air passing through intake valves is less than the volume of air passing through exhaust valves

D. intake valves are less affected to the corrosive action of exhaust gases

11. Why is it essential to renew turbocharger bearings after a preset number of hours of running even if the bearings are in seemingly perfect condition?

A. Because they are prone to failure due to prolonged exposure to high temperature conditions.

B. Because they are subject to cyclic loading and are prone to failure due to metal fatigue.

C. It is not essential to renew if condition monitoring suggests perfect condition.

D. Lube oil contamination is bound to occur and affect the condition of the bearings.

12. Which of the following statements is true?

A. The rotary vane type steering gear generally operates at higher oil pressures than the ram type.

B. The ram type steering gear generally operates at higher oil pressures than the rotary vane type.

C. Both ram type and rotary vane type steering gears generally operate at similar oil pressures

D. None of the above

15. Modern marine turbochargers use a _____ type of compressor

A. Radial flow

B. Axial flow

C. Mixed flow

D. Turbulent flow

16. Which of the following is a disadvantage of water as cooling medium for pistons, when compared to oil?

A. Chemical treatment is required

B. Higher thermal stresses in piston

C. Piston of more complicated design

D. All of the above

17 How is the concentration of dissolved oxygen in the feed water of an auxiliary boiler maintained at acceptable limits?

A. Feed water is cycled through a DC heater.

B. Feed water is treated with phosphates.

C. Oxygen is liberated in the three-stages of feed water preheating.

D. Oxygen is liberated by maintaining the highest practical feed water temperature

18. In a 2-stroke marine diesel engine if the o-ring for Jacket cooling water sealing is leaking then

A. The water will leak directly into the crankcase

B. The water will leak into the under piston space

C. The water will come out through tell-tale hole provided between the two o-rings

D. The water will come out from the top of cylinder jacket

19. The lube oil pump used in a diesel engine is a

A. volute pump

B. centrifugal pump

C. diaphragm pump

D. gear pump

20. Prior to lighting off a cold automatically fired auxiliary boiler, you should

A. check and regulate the water level

B. close the air cock once fires are lit

C. blow down the gage glass

D. crack the steam stop to assure protective steam flow

21. Steam temperature control for the ESD-II boiler is achieved by :

A. Fitting a de-superheater between 1st & 2nd passes of superheater

B. Fitting an attemperator between 1st & 2nd passes of superheater

C. Gas dampers in boiler uptake

D. Bypassing the superheater

22. The coating which is provided on the valve stem of exhaust valves of modern marine diesel engines is of:

- A. Nickel
- B. Stellite**
- C. Chromium
- D. Nimonic

23. If the combustion control system of an automatically fired auxiliary boiler fails to sustain burner ignition after a normal shutdown, you should check for a/an

- A. faulty photocell detector**
- B. low steam pressure
- C. high voltage on the ignition electrode
- D. open air damper

24. Which of the following statements is true, about slow speed engines?

- A. A scavenge fire can lead to a crankcase explosion
- B. A scavenge fire can lead to deformation of diaphragm plate
- C. A scavenge fire can lead to damage to tie rods.
- D. All of the above.**

25. For a two stroke engine two o-rings are provided on the liner. The function of the top o-ring is to _____ and function of the lower o-ring is to _____

- A. Seal jacket cooling water; act as secondary seal in case 1st o-ring leaks
- B. Seal jacket cooling water, Seal scavenge air**
- C. Seal scavenge air, Seal Jacket cooling water

D. Seal combustion gases, Seal jacket cooling water

26. Even if there is an oil mist concentration inside a crankcase, and there is also a hot spot, crankcase explosion will only take place when

A. The hot spot provides the ignition temperature for the oil mist concentration

B. When the oil mist - air mixture is in the flammable range

C. Both A and B

D. None of the above

27. Which of the following conditions is responsible for the fuel oil to atomize when using a steam atomizer in an auxiliary boiler?

A. Expansion of the steam in the furnace.

B. Expansion of the steam in the whirling chamber.

C. Expansion of the steam in the orifice plate.

D. All of the above.

28. Some 4-stroke engines are fitted with a rotorcap on the cylinder head valves. For what reason?

A. Rotate the inlet valve during operation.

B. Distribute the exhaust gas or the air inlet better to improve combustion.

C. Improve the sealing surface function, increase the service time of the exhaust valve in the engine

D. To prevent the valve spindle from sticking

30. Shaft tunnel requires

- a) drain
- b) escape trunk
- c) water tight door
- d) all the above

31. What do you mean by surge limit of a turbocharger?

- A. Characteristic curve of a turbocharger
- B. Portion of compressor characteristic curve which lies on the left side of the point of maximum pressure
- C. A line joining all the points of maximum pressure on compressor characteristic curves , drawn at various speeds of operation
- D. Maximum rpm limit of T/C above which surging will start

32. A large, low-speed, main propulsion diesel engine uses sea water to directly cool the

- A. cylinder heads
- B. exhaust valves
- C. scavenging air
- D. injectors

33. Exhaust Grouping is required in case of _____ turbocharging in order to

A. Constant pressure, prevents shockwave generation

B. Pulse pressure, prevent interference with scavenging of other cylinders

C. Constant pressure, prevent interference with scavenging of other cylinders

D. Pulse pressure, prevents shockwave generation

34. Function of a de-superheater is to.

A. Protect superheater from overheat

B. Control superheater steam outlet temperature

C. Increase the efficiency of the boiler

D. Reduce steam temperature for auxiliary uses after steam superheater

35. Which of the following statements is false?

A. Oxidation of lubricant leads to decrease in its viscosity

B. Formation of oxidation acids, sulfuric acid leads to depletion of TBN of lubricant

C. Contamination with water will lead to decrease in the load carrying capacity of a lubricant .

D. Build up of insolubles will lead to increase in viscosity of a lubricant

37. After prolonged operation, jerk type fuel pumps wear on the top edge of plunger and edges of spill ports and helix due to erosion by high pressure fuel as it spills. This wear would result in

- A. Late start of injection and early end of injection**
- B. Early start of injection and late end of injection
- C. Early start of injection and early end of injection
- D. Late start of injection and late end of injection

38. Labyrinth seal fitted on the back surface of a compressor wheel of a turbocharger:

- A. Prevents bearing lube oil contamination
- B. Prevents bearing lube oil being sucked into the air stream
- C. Helps to keep the shaft cool by controlled leakage of air**
- D. None of the above

39. It is a known fact that centrifugal pumps require priming for pumping liquids , as they cannot handle air and will lose suction due to air entry . But on the other hand T/Cs use centrifugal compressors for supercharging. Which of the following do you think makes a centrifugal compressor to pump air and behave differently than the centrifugal pumps?

- A. Presence of air cooler
- B. Presence of Labyrinth seal
- C. High speed of rotation, very fine internal clearances and large impeller diameters**
- D. Difference in principle of operation

40. If an operating auxiliary boiler has a water pH reading of 7, you should

- A. bottom blow the boiler
- B. treat the water with caustic soda**
- C. treat the water with chemical scavengers
- D. reduce the water alkalinity to recommended readings

41. In case of 2-stroke marine diesel engines, the top part of the liner forming the combustion chamber experiences very high pressure induced mechanical stresses as well as high thermal stresses. Which of the following is a correctly designed liner for catering both the above stresses?

- A. Thick top portion with jacket cooling to take care of both the high mechanical and thermal stresses
- B. Thick top portion to take care of high mechanical stresses while bore cooling to reduce thermal gradients**
- C. Thin top portion to reduce thermal gradients and hence thermal stresses while supporting

ribs to take care of mechanical stresses

D. Thick top portion to take care of high mechanical stresses with jacket cooling combined with allowance for thermal expansion to minimize the thermal stresses

42. Which of these fuel oil impurities can cause maximum abrasive damage?

A. Water

B. Ash

C. Catalytic fines

D. Sodium

43. In modern marine 2-stroke diesel engines, _____ is sometimes used as a coating on the underside of the exhaust valve disc, to reduce the rate of hot corrosion.

A. Monel

B. Chromium

C. Inconel

D. Cermet

44. Irregular circumferential wear of liner due to diminishing neutralizing capacity of cylinder oil away from lubricating holes is known as:

A. Micro seizure

B. Scuffing

C. Scoring

D. Clover leafing

45. Which of the following is a reasonable statement about water washing of turbine side of a T/C ?

- A. It leads to thermal shock and reduces the life of the T/C
- B. It leads to thermal shock and not so effective as solid washing
- C. If properly carried out keeping rpm, load, temperature limits & other factors into account; it is quite safe and more effective than solid washing
- D. It should never be carried out as most of the engine manufacturers recommend against the same

46. Which of the following statements correctly describes the phenomenon of surging in a 2-stroke crosshead type engine?

- A. Due to sudden increase in engine load the exhaust gases may flow back through scavenge ports causing surge
- B. Due to sudden decrease in engine load the turbocharger pressure ratio drops . This causes high pressure downstream of T/C in scavenge trunk causing flow reversal of scavenge air
- C. Due to sudden increase in engine load , the T/C turbine rpm may increase suddenly increasing the compressor pressure ratio to surge
- D. Due to sudden decrease in engine load , the turbocharger may stall as the higher pressure downstream in exhaust system may cause reversal of flow of exhaust gases

47. If the boiler tubes are scaled on the water side then

- A. Heat conduction through the tubes will be very high leading to rapid evaporation
- B. The boiler furnace can get damaged due to excessive temperatures
- C. The surface of the tube will be overheated as heat transfer is impaired
- D. The natural circulation of water within the boiler will be more efficient

48. Fins are installed on the generating tube surfaces in waste heat boilers to

- (A) Prevent soot fires in the exhaust system
- (B) Prevent exhaust gas erosion of the tubes
- (C) Increase the velocity of exhaust gas flow
- (D) Increase the rate of heat transfer**

49. Any steering gear system alarm can only be successfully acknowledged from

- A. The bridge
- B. The engine control room**
- C. The steering compartment
- D. The ship's office

50. To check the setting of the over speed trip on a diesel powered generator, you would

use a

- A. tachometer**
- B. torsion meter
- C. dynamometer
- D. pony brake

51. Which of the following specifications/qualities of cylinder oils counter corrosive wear?

- A. Viscosity
- B. TBN**
- C. Detergency
- D. Specific gravity

52. What is meant by elastohydrodynamic lubrication?

- A. Formation of hydrodynamic film under high pressure with minor elastic deformation of mating surfaces, distributing load over a greater area
- B. Addition of extreme pressure additive (EP) to the lubricant
- C. Addition of Viscosity index improvement additive
- D. Addition of elastomer based additives

53. In a bypass type filtering system for a medium or high speed diesel engine, the lube oil bypassing the filter

- A. returns directly to the suction side of the pump
- B. returns directly to the sump
- C. flows to the engine bearings
- D. flows through a second-stage strainer, reheater, and returns to the sump

54. Which type of boiler burner has max turn down ratio?

- a. Pressure set
- b. spinning cup
- c. Spill type
- d. Y-jet type

55. Most steam traps respond well to cleaning. But when a thermodynamic trap fails to operate after cleaning, the next course of action should be

- A. throttle the steam outlet valve
- B. renew the trap
- C. lap the disc and seat the trap
- D. throttle the steam inlet valve

56. Types of corrosion in fresh water of D/E

- a. Stress
- b. hot corrosion
- c. bimetallic
- d. selective phase corrosion

57. Which of the following types of damages are metal seatings of a valve subject to?

Choose the correct alternative.

- A. Corrosion, Erosion, Abrasion, Deformation
- B. Corrosion, Fatigue failure, brittle fracture, caustic cracking
- C. Erosion, caustic cracking, brittle fracture, Clover leafing
- D. None of the above

58. When A/E stand by F.O.heater to be used for main engine

- A. Sudden opening F.O. inlet valve pressurized and damage the heater
- B. F.O. in vapor lock inside heater allow steam

C. F.O. inlet valve causes pressure drop M/E F.O. pressure standby water is not pressurized may cause sudden change in engine /per load/rpm

D. heater leaking.

59. Viscosity of fuel oil used for ME was 145cst, new fuel comes whose viscosity was more than earlier, what u should do

- a) Increase temp setting
- b) Change setting of viscotherm
- c) Do nothing**
- d) Open steam valve manually more

60. Which of the following can be done to reduce the cold corrosion of Main Engine cylinder liners using high sulphur fuel oil

- A. Increasing cylinder oil feed rate
- B. Using high TBN cylinder oil**
- C. Increasing scavenge air temperature
- D. Decreasing cylinder oil feed rate

61. When m/e is running in emergency condition which of the alarms can't be bypassed

- 1. LO low pressure
- 2. Jacket water high temp
- 3. Piston cooling water high temp
- 4. All the above**

62. Which of the following will be required to be done in order to reduce sulphur corrosion of main Engine Components?

- A. Increasing the atomization pressure of fuel injectors
- B. Fitting exhaust valves with valve rotators
- C. Running engine at or near normal sea load
- D. Decreasing the F.O. purifier feed rate , running two purifier in series one acting as purifier and other as clarifier

63. Where boiler point temp high?

- A) Riser
- b) Superheater
- c) Primary steam drum
- d) Secondary steam drum

64. Sudden stop of diesel engine (multiple choices)

- A. air in system
- B. water in system
- C. air filter choked
- D. water in air filter

65. Mixed lubrication consist of

1. Mix two lubes oil
2. Contimantiön of hydrodynamic lube oil.
3. Mixed grease and oil

66. The muffling of exhaust gas noise in 4 stroke auxiliary engines in achieved by

- (a) Allowing the gas to expand.
- (b) Change the direction of their flow.

(c) Cool the gas with injected water.

(d) Cool the gas with scavenge air.

67. An auxiliary engine turbo-charger makes strange noises when the load changes. The engine parameters however are absolutely fine. An external examination of turbocharger parameters as stated in the manual also reveals nothing. Would you

(a) Continue to run the engine and wait for some time

(b) Stop the engine for a while and make some checks

(c) Reduce the load of the engine

(d) Run it on steady load to make some checks.

68. To avoid the engine running too long on critical speed during start up it is necessary to

(a) Start at speeds above critical speed.

(b) Start at speeds just below critical speed and quickly move across the critical speed.

(c) Start at maximum speed and quickly bring down to just above critical speed.

(d) Eliminate totally the hazards of critical speed by ignoring it.

69. Supercharging an existing medium speed naturally aspirated engine will

(a) Reduce weight of the engine.

(b) Reduce bulk of the engine.

(c) Increase existing power.

(d) Increase piston speed.

(e) Reduce fuel consumption.

71. When using low sulfur fuel oil for Emission Control Areas (ECA???)S), ideally the

TBN of the cylinder oil used should be

- A. Lower than normal**
- B. Higher than normal
- C. Same as normal
- D. Same as normal if the feed is kept higher

72. Which of the following functions is done by a cam operating an exhaust valve?

- A. It governs the timing of opening and closing of the valve.
- B. It governs the speed at which the valve operates
- C. It governs the amount of opening of the valve
- D. All of the above**

73. In the latest concept of Variable Geometry Turbocharging, _____ angle can be varied to match the turbocharger at varying engine loads

- A. Compressor vane
- B. Turbine blade
- C. Nozzle ring blade**
- D. Diffuser ring blade

74. The primary function of a flame safeguard system, as used on an automatically fired auxiliary boiler, is to prevent

- A. accidental dry firing and overpressure
- B. uncontrolled fires in the furnace
- C. explosions in the boiler furnace**
- D. explosions in the boiler furnace

75. Directional intake ports in diesel engines are used to

- A. reduce air charge turbulence
- B. induce air swirl**
- C. deflect hot combustion gas away from the valves
- D. oppose the effects of piston induced squish

76. Why does a chain stretch in service?

- A. Due to plastic elongation
- B. Due to high temperature expansion
- C. Due to wear on rollers and bushes**
- D. Due to the phenomenon of creep

77. Which of the following methods is normally used to lubricate bearings in a small high-speed diesel engine?

- A. Splash lubrication
- B. Pressure lubrication**
- C. Sight feed lubricators
- D. Mechanical lubricators

78. External fouling of boiler tubes can lead to:

- A. Greater steam generation
- B. Tube corrosion**
- C. Tube Erosion
- D. Protection of tube against corrosion

79. What is the purpose of the inlet grid provided within the exhaust gas casing in the

gas flow path, prior entry to turbocharger ?

- A. To filter out any unburned carbon
- B. To absorb and dampen the pressure fluctuation
- C. To reduce noise in the constant pressure exhaust piping
- D. To prevent any broken piston rings finding their way to turbine**

80. The main function of tie rods in the construction of large, low speed diesel engines is to

- A. stiffen the bedplate in way of the main bearings to increase the engine's longitudinal strength
- B. accept most of the tensile loading that results from the firing forces developed during operation**
- C. mount the engine frame securely to the hull to prevent shaft coupling misalignment
- D. connect the crosshead solidly to the piston rod

81. The fall in speed that occurs in a diesel engine equipped with governor, on increase of load is called:

- A. Offset
- B. Speed drop
- C. Speed droop**
- D. Speed offset

82. Which of the following factors governs the lower limit of thrust bearing clearance?

- A. To allow some oil leakage to prevent overheating
- B. Reduction of oil viscosity

C. Alignment of crankshaft

D. To allow the thrust pads to tilt and generate the oil wedge

83. Which of the following can result in cracking of piston crown?

A. Deposits in cooling spaces

B. Impingement of fuel due to faulty injection

C. Insufficient piston cooling oil flow

D. All of the above

84. The boiler water alkalinity in a coil-type auxiliary boiler should be maintained at the pH recommended by the boiler manufacturer to

A. precipitate silica from solution

B. reduce corrosion in the heating coil

C. prevent clogging and erosion in the coil

D. maintain zero water hardness

85. What does the NLGI number of a grease indicate?

A. The oxidation resistance of the grease

B. The consistency of the grease i.e how fluid or non fluid

C. Demulsibility of the grease

D. The shelf life of the grease

86. Which of the following layers of a thin shell bearing gives it its fatigue strength?

A. The overlay

B. The interlay

C. The backing

D. The barrier layer

87. Which of the bearings listed is most widely used for main and connecting rod bearings of modern diesel engines?

- A. Steel-lined
- B. Poured babbitt, self-aligning
- C. Split roller
- D. Precision insert**

88. Which of the following statements is false?

- A. The fuel oil sulfur level is one of the important criteria for choice of TBN level of cylinder oil.
- B. The use of anti-polishing rings or flame rings increases the consumption of cylinder oil**
- C. Excessive cylinder oil feed can lead to harmful deposits in piston top land area
- D. None of the above

89. When preparing to light off a cold boiler equipped with a return flow fuel oil system, the recirculating valve directs the flow of oil

- A. directly to the fuel oil heater inlet for further warm-up
- B. back to the fuel oil settler for further filtration
- C. back to the suction side of the service pump**
- D. directly to the deep tanks

90. Prompt correction of speed of diesel engines driving alternators, without having massive fluctuations is ensured by incorporating:

- A. Load limiting devices
- B. Load sharing devices
- C. Load sensing devices
- D. Load shedding devices

91. In a uniflow scavenged marine 2-stroke diesel engine, the scavenge ports in a cylinder liner are machined

- A. Only for a part of the circumference, at an angle almost tangential to the circumference of the liner
- B. All around the circumference at right angles to the circumference of the liner
- C. only for a part of the circumference, at right angles to the circumference of the liner
- D. All around the circumference at an angle almost tangential to the circumference of the liner

92. If the tappet clearance between the rocker arm tappet and exhaust valve stem is excessive then:

- A. The valve will open early and close later
- B. The valve will open later and close early
- C. The valve will open and close later
- D. The valve will open and close early

93. In order to reduce thermal loading on the upper part of the liner and increase the effectiveness of cylinder lubrication, modern 2-stroke marine diesel engines are designed to have:

- A. Cermet coated piston rings, bore cooled liners and uniflow scavenging
- B. High top land of piston crown and deeper cylinder cover with top land of crown extending into cylinder cover at TDC**
- C. Low top land of the piston crown with bore cooled cylinder liner
- D. Bore cooled cylinder liner and bore cooled piston crown with toroidal shape combustion chamber

94. Which of the following conditions can lead to reduced power developed by a main engine?

- A. High scavenge air temperature
- B. Choked air suction filter of a turbocharger
- C. Blow past in one or more units
- D. All of the above.**

95. Which of the following types of diagrams would give an indication of effectiveness of exhaust and scavenge processes?

- A. Power card
- B. Draw card
- C. Light spring diagram**
- D. All of the above.

96. The arrangement used to protect overheating of the superheaters under fluctuating loads is called

- A. De-superheater
- B. Attemperator**

C. Steam dumping valve

D. Feed heater

97. Piston rod stuffing box scraper rings butt clearances should:

A. Not to be allowed to fall below 50% of original clearance

B. Not to be allowed to increase above 50% of original clearance

C. Not to be allowed to fall below manufacturer recommended value

D. Not to be allowed to increase above manufacturer recommended value

98. In a 2-stroke engine a _____ separates the under piston space from the crankcase.

A. A-frame

B. Crosshead

C. Diaphragm

D. Scavenge space

99. Fusible plugs are installed in fire-tube boilers to

A. provide a means of draining the boiler

B. warn the engineer of low water level

C. cool the crown sheet at high firing rates

D. open the burners' electrical firing circuits

100. Which of the following gauges are generally used to evaluate main bearing clearances?

A. Poker gauge

B. Feeler gauge

C. Telescopic feeler gauge

D. Dial gauge

101. In a coil-type auxiliary water-tube circulation boiler

A. unevaporated feedwater collects in the bottom of the flash chamber

B. all generated steam is recirculated through heating coils in the boiler

C. heated water flashes to steam in the boiler heating coils

D. response to steam demand is slower than in a fire-tube boiler

102. For a continuous operation diesel engine, a duplex filter unit would be the best arrangement because

A. changing filter elements would not interrupt engine operation

B. filtering occurs twice in each pass of oil through the system

C. clogging will not occur

D. dropping pressure is half of that through a single filter unit

103. As per regulations, within how many hours before each departure, satisfactory working of the steering gear must be checked?

A. 2

B. 12

C. 24

D. None of the above

104. Modern 4-stroke medium speed, marine diesel engine exhaust valve spindles are rotated by providing

A. Nozzle rings

- B. Tappet clearance
- C. Spinners or vanes
- D. Rotocaps**

105. The purpose of economizer is to:

- A. Decrease the capacity and size of the auxiliary boiler
- B. Cooling down the exhaust gases in order to reduce NOx emission
- C. Allowing Sox to react at low temperatures with water to form acids thus reducing Sox emission
- D. Increasing the overall efficiency of the main propulsion plant**

106. Microbiological growths in marine fuel are a common occurrence that can be

- A. extremely detrimental to equipment and operating processes**
- B. prevented by maintaining proper storage temperatures
- C. removed from emulsified fuel oil during the centrifuging processes
- D. All of the above are correct.

107. The function of the tie rods is to:

- A. Keep the engine components under tension at all the times
- B. Just secure the engine parts together
- C. Act as holding down bolts for the bedplate and keeps all the engine components together
- D. Keep engine components under high compression, so that tensile stresses acting during firing stroke do not exceed this pre-compression to avoid fatigue failure**

108. Which of the following types of crankshafts is much lighter at similar power

requirements?

- A. Fully built type
- B. Semi built, all welded type**
- C. Semi built type
- D. Solid forged type

109. After an engine has been started using a Bendix drive unit, the drive gear, or pinion disengages from the flywheel due to

- A. the action of a spring
- B. rotation of the starting cam
- C. the higher rotating speed of the flywheel**
- D. accumulator pressure

110. Fuels as produced in a refinery are generally sterile, however, contamination can occur as fuels are

- A. stored at the refinery
- B. stored on the vessel
- C. transported to the distribution sites
- D. All of the above are correct.**

111. Which of the following statements is false?

- A. Excessive cylinder liner lubrication can aggravate scuffing.
- B. Use of anti polishing ring reduces scuffing.
- C. Deep honing of liner fails to give an ideal liner surface.**
- D. None of the above**

112. In a fully built or semi built type crankshaft, how can any slippage at shrink fit be identified?

- A. By inspecting the locking arrangement provided
- B. By checking the dowel provided.
- C. By checking the witness mark provided for reference .**
- D. By checking the performance of the engine

113. Which of the following is one of the major advantages of resin chocking over cast iron chocking, in holding down arrangements of modern diesel engines?

- A. Better vibration damping properties.
- B. Better compressive strength
- C. 100% contact, no need for surface preparation**
- D. None of the above

114. In a 2-stroke crosshead type of engine, the side thrust generated due to rolling and connecting rod and fore-aft thrust due to pitching motion of the ship is taken care of by the:

- A. Piston and the liner
- B. Connecting rod and the piston rod
- C. Crosshead shoes and guides**
- D. Crankpin and thrust bearing

115. In a VIT equipped jerk type fuel pump:

- A. Raising the barrel delays beginning of injection**
- B. Lowering the barrel delays beginning of injection

- C. Raising the barrel delays end of injection
- D. Lowering the barrel delays end of injection

116. The over speeding of the diesel engine driving an electric generator could cause

- A. low voltage trip to trip
- B. reverse power trip to trip
- C. damage to windings
- D. excessive exhaust temperatures

117. In a large, slow-speed, main propulsion diesel engine, which of the parts listed is under tension when the engine is running?

- A. Bed plate
- B. Column
- C. Entablature
- D. Tie rod

118. A diffuser is provided at the end of a mechanical atomizer in boiler onboard

- A. To prevent blow back of the flame
- B. To mix the air and fuel properly
- C. To prevent blow out of the flame
- D. To eject the excess fumes from the atomizer

119. Steam stop valve is eased of its seat during boiler start up from cold

- A. To allow thermal expansion of parts
- B. To allow steam flow during start up
- C. To prevent water hammer

D. All of the above

120. Which of the following statements about the design of D- type boilers, is false ?

A. The heavier water in top drum flows back to the bottom drum through the down-comers outside the furnace

B. Inside the furnace the water is heated up in the risers

C. The upper drum is the steam/water drum and the lower one is the water drum.

D. The feed water is pumped into the lower drum

121. Presence of catalytic fines in fuel oil is significant to engineers on board because

A. Catalytic fines tend to impair proper operation of purifiers

B. Catalytic fines lead to abrasive wear in liners, piston rings and fuel injection equipment

C. Catalytic fines necessitate increase in injection temperature

D. Catalytic fines necessitate increase in storage temperature

122. With reference to the data logger for a refrigerate sys. Which of the parameters should be noted?

A. Sea water temp, pressure

B. Condenser temp

C. Refrigerant leakage

D. Evaporator temp.

123. Which of the following factors affect penetration of fuel droplets during injection?

A. Quality of atomization

B. Injection temperature

C. Scavenge air pressure

D. All of the above.

124. Lube oil pumps taking suction from the sump of most small marine engines are usually

A. of the diaphragm type

B. of the centrifugal type

C. positive displacement type

D. independently driven by electric motors

125. Telescopic pipes to the piston of a large slow-speed main propulsion diesel engine are designed to prevent

A. excessive crankcase pressure

B. excessive lube oil temperature

C. contamination of the lube oil by water

D. contamination of the cooling water by lube oil

126. Excessive axial thickness of a piston ring can lead to _____

A. Scraping off of oil from liner surface

B. Increased wear

C. Twisting in the groove

D. Difficulty in formation of oil wedge

127. Which of the following is an adhesive type wear of a cylinder liner?

A. Clover-leafing

B. Scoring

C. Scuffing

D. Ovality

128. Cylinder heads of marine diesel engines are provided with _____ to relieve any excessive pressure within the combustion chamber

A. Safety valves

B. Indicator cocks

C. Relief valves

D. Bursting discs

129. Working of a pulse pressure turbocharger depends upon the _____ that can be safely created in the exhaust system.

A. Enthalpy drop

B. Pressure difference

C. Turbocharger rpm

D. Pressure pulses

130. The maximum elongation of timing chains in service is limited to _____ of original chain length.

A. 2%

B. 1%

C. 5%

D. 3%

131. Duplication of power units, fittings and pipings where each unit is capable of providing 100% steering power, and automatic isolation of one unit in the event of a leakage(single failure) in that unit would constitute 100% redundancy for the steering gear system. Such

system is mandatory on _____

- A. All tankers
- B. Tankers above 10000 GT**
- C. Tankers above 100000 Dwt
- D. All ships above

132. Routine cleaning of air side of air cooler of main engine is done by:

- A. Circulating fresh water
- B. Circulating cold chemical solution
- C. Circulating warm chemical solution**
- D. Circulating hot water

133. What prevents rotation and fretting between a thin shell bearing and its housing?

- A. Location tangs or pegs
- B. The nip or crush of the bearing**
- C. A special kind of adhesive
- D. Any of the above

134. Microbial degradation of main engine sump oils can lead to:

- A. Increased clogging of lube oil filters
- B. Corrosive attack on journals and bearings
- C. Formation of stable emulsions
- D. All of the above.**

135. In case of constant pressure turbo charging, the exhaust of the cylinders goes into :

- A. Small diameter exhaust pipes with exhaust grouping

B. Exhaust compensators

C. Nozzles

D. Large diameter pipes

136. Which of the following is a limiting factor in cylinder liner cooling?

A. Maximum combustion temperature

B. Minimum liner temperature

C. Exhaust temperature

D. Dew point for formation of sulfuric acid

137. Which of the following is not a consequence of over lubrication of a cylinder liner?

A. Deposits in piston top land which can not only consume lube oil but always lead to increased abrasive wear .B. Sticking and jamming of piston rings due to increased deposits.

C. Unburnt lube oil in scavenge spaces posing increased risk of scavenge fire .

D. Increased corrosive wear

138. Variable geometry turbocharging is the preferred choice over conventional turbochargers because :

A. T/C efficiency is very high at high engine loads

B. T/C has good starting characteristics while efficiency at full loads is slightly compromised

C. T/C efficiency is optimized for different engine loads by changing nozzle ring geometry

D. T/C is much cheaper and simple to manufacture and is virtually maintenance free

139. As a thumb rule, ovality in crankpins of medium speed engines should not exceed _____ of bearing clearance.

A. 10%

B. 15%

C. 25%

D. 30%

140. In a naturally aspirated diesel engine, the volume of air intake is directly related to engine

A. compression ratio

B. valve size

C. fuel pressure

D. cylinder clearance volume

141. Two important considerations for the proper lubrication of a diesel engine include, the delivery of the oil in sufficient amount, and the

A. cetane number

B. pour point

C. viscosity temperature

D. quality of the oil

142. What is material of impeller of a T/C compressor ?

A. Stainless steel

B. Mild steel

C. Aluminium silicon

D. Bronze

143. One of the major disadvantages of constant pressure turbocharging over pulse

pressure turbocharging is :

- A. Reduction in specific fuel consumption
- B. Lengthening of effective stroke leading to greater expansion in engine
- C. Poor turbocharging efficiency
- D. Inability of the system to operate at low loads and slow response during acceleration**

144. Friction, engine wear, and oil consumption in a diesel engine are directly related to the

- A. acidity of the oil
- B. pour point of the oil
- C. flash point of the oil
- D. viscosity of the oil**

145. Improper maintenance of an automatic auxiliary boiler oil burner could result in

- A. fuel pump failure
- B. fan motor failure
- C. increased feedwater consumption
- D. decreased boiler efficiency**

146. The effect of excessive tappet clearance is:

- A. Increased engine efficiency as expansion can take place for a longer duration and less energy wasted with the exhaust gases
- B. Valve hammering, change in timing of exhaust with more side thrust causing greater wear between stem and bush**

C. Loss in compression, poor combustion, improper mixing of fuel & air and gas leakage due to improper closing of valve

D. Turbocharger surging, loss of rotation of valve spindle and high exhaust temperatures

147. The difference between rotocap and spinners for rotating exhaust valve spindle is that:

A. Rotocaps rotate the valves while closing, while spinners rotate them while opening

B. Rotocaps rotate the valves while opening, while spinners rotate them while closing

C. Rotocaps rotate the valves while opening, while spinners rotate the valve for the entire duration until valve is seated

D. Spinners rotate the valves while opening, while rotocaps rotate the valve for the entire duration until valve is seated

148. Most fuel injection nozzles are opened by

A. fuel oil pressure

B. a cam operated follower

C. a spring-loaded pressure plate

D. timing gears keyed to the crankshaft

149. Which of the following is a electro- hydraulic type steering gear

A. Rotary Vane type

B. Ram type

C. Both rotary vane type and ram type

D. None of the above

150. Which of the following purposes is solved by a piston rod gland or stuffing box ?

- A. To provide an air seal between scavenge space and crankcase
- B. To prevent ingress of combustion products, unused cylinder lube oil, debris etc into the crankcase**
- C. To prevent carry over of sump oil into the crankcase
- D. All of the above

151. Which of the following is a feature of Sulzer TriboPack package?

- A. Mid level liner insulation
- B. Deep honing of liner
- C. Pre- profiled and coated piston rings
- D. All of the above**

152. In which of the following steering modes, rudder will be locked at a particular angle until next manual order?

- A. Follow up
- B. Auto pilot
- C. Non Follow up**
- D. None of the above

153. Failure of the burner flame in an automatic auxiliary boiler would probably be a result of

- A. water in the fuel oil**
- B. broken high tension leads
- C. incorrect electrode setting
- D. full fuel pressure at the nozzle

154. As per regulations, the torque capacity of a steering gear system should be such so as to be able to turn the rudder_____

- A. 35 degrees one side to 35 degrees on the other side at maximum service speed
- B. 35 degrees one side to 30 degrees on the other side at maximum service speed**
- C. 35 degrees one side to 35 degrees on the other side at normal service speed
- D. 35 degrees one side to 30 degrees on the other side at normal service speed

155. The output pressure of a diesel engine lube oil pump is regulated by a/an

- A. relief valve**
- B. metering valve
- C. variable speed pump drive
- D. orifice in the lube oil header

156. Most T/C have ----- flow type of Compressor and -----flow type of Rotor

- a. Centrifugal Radial , Impeller axial**
- b. Centrifugal axial, Impeller radial
- c. Centrifugal mixed, Reaction Radial
- d. Rotary axial, Reaction Radial

157. Factors of lower limit of thrust by clearance

- a. Adjustment of crankshaft
- b. To allow thrust pads to tilt generated oil wedge**
- c. Proper lubrication

158. use of synthetic polymer treatment limited to low pr boiler, why?

- a. does not help in prevention of scale formation
- b. does not help in corrosion prevention
- c. does not form phosphate to tackle caustic embrittlement
- d. all of above

SECTION 2

OLD QUESTION

1. While an auxiliary boiler is operating at design load, which of the following actions will occur if the automatic combustion control system detects a steam pressure drop?

- (A) More burners will be lighted off.
- (B) The registers will open fully.
- (C) The fuel oil valve and air damper will open wider.
- (D) The steam flow will be automatically regulated.

2. A unit type fuel injector is used on a diesel engine to _____.

- (A) meter the fuel
- (B) produce the proper fuel oil pressure
- (C) atomize the fuel
- (D) all of the above

3. With the help of explanatory sketches briefly state the lubrication system for a large 2 stroke slow speed marine diesel engine for the following.

- (A) camshaft bearings
- (B) main bearings
- (C) piston crosshead bearings
- (D) cylinder walls

4. If the valve tappets in a diesel engine are set at greater clearances than those specified by the engine manufacturer, those valves will _____.

- (A) open late and close early
- (B) open late and close late
- (C) fail to open when the engine is cold
- (D) fail to open at normal operating temperature

5. Regarding a Diesel engine crankcase, the general arrangement and installation should preclude the possibility of _____.

- (A) free entry of air to the crankcase
- (B) water entering the crankcase while engine washdowns are being performed
- (C) excessive oil leakage during periods of increased blowby
- (D) subcooling internal components

6. The growth rate of microbiological organisms as found in some fuel supplies will _____.

- (A) increase in direct proportion to an increase in temperature
- (B) decrease if bleaches are added to the fuel on a regular basis
- (C) remain unchanged provided complete consumption of the fuel occurs monthly
- (D) All of the above

7. Fuel injection pumps using the port and helix metering principle requires the use of

a _____.

- (A) crosshatched design
- (B) lapped plunger and barrel
- (C) variable stroke
- (D) variable cam lift

8. Internal combustion engine crankcase vent outlets must be equipped with _____.

- (A) hinged rain guards
- (B) corrosion resistant flame screens
- (C) dipsticks for measuring oil levels
- (D) crankcase ventilation fans

9. Proper lubrication of the main bearings is more easily obtained in a single acting four-stroke/cycle diesel engine than in a single acting two-stroke/cycle diesel engine because _____.

- (A) bearing pressure in a four-stroke/cycle single acting diesel engine is continually reversed
- (B) bearing pressure in a two-stroke/cycle single acting diesel engine is continually reversed
- (C) the maximum bearing pressure is higher in a single acting two-stroke/cycle diesel engine
- (D) two-stroke/cycle diesel engines require more complicated lubrication piping

10. Increasing the valve clearance between a valve stem and rocker arm, will result in the valve _____.

- (A) closing later
- (B) opening sooner
- (C) staying open for a shorter period of time
- (D) staying open for a longer period of time

11. What preventative maintenance should be done frequently to diesel engine starting air receivers?

- (A) Drain the accumulated moisture.
- (B) Test the relief valves.
- (C) Watch the temperature to prevent fluctuations in pressure.
- (D) Clean the interior to remove oil and foreign matter.

12. Friction developing between the moving parts of a governor, governor linkage and control valve will cause the governor to _____.

- (A) react with insufficient speed droop
- (B) fail to react to small speed changes**
- (C) have excessive sensitivity to small speed changes
- (D) remain in the neutral position

13. To minimize corrosion, fuel oil strainer disks, spacers and scraper blades are made of _____.

- (A) brass
- (B) copper
- (C) iron
- (D) monel metal or stainless steel**

14. In a diesel engine, maximum lube oil system pressure is normally controlled by _____.

- (A) the capacity of the lube oil pump
- (B) the speed of the lube oil pump
- (C) the outlet pressure of the lube oil pump
- (D) a relief valve**

15. Which of the following statements describes the function of an expansion tank in a diesel engine cooling system?

- (A) Maintains a constant head on the system.
- (B) Reduces the likelihood of air or steam pockets formation.

(C) Provides a low pressure point for the addition of makeup cooling water.

(D) All of the above.

16. Within the cycle of a forced circulation auxiliary water-tube boiler, part of the water flashes into steam, and the remaining hot water is _____.

(A) collected in the lower portion of the steam accumulator for recirculation back to the heating coil or water tank

(B) returned to the lower drum via downcomers due to density difference for reheating

(C) passes through the domestic heating system return line steam traps to the auxiliary feed supply tank

(D) automatically dumped into auxiliary feed heater and reheated by auxiliary exhaust back pressure

17. Ignition failure in an automatically controlled auxiliary boiler could be caused by _____.

(A) carbon deposits on the flame scanner

(B) high fuel oil temperature

(C) low fuel oil viscosity

(D) high steam pressure

18. Which of the fuel injection systems listed uses a spring loaded differential spray needle valve and an individual pump for each cylinder?

(A) Common-rail injection

- (B) Air injection
- (C) Jerk pump injection
- (D) Distributor injection

19. The interior of some diesel engine saltwater heat exchangers are protected from corrosion by the use of _____.

- (A) aluminum plates
- (B) lead cathodes
- (C) copper baffle plates
- (D) sacrificial zincs

20. The amount of chloride content in the water of an auxiliary boiler can be reduced by _____.

- (A) adding hydrazine
- (B) blowing down the boiler
- (C) adding phenolphthalein
- (D) adding a sulfite chloride scavenger

21. Cooling water pumps driven by direct reversing diesel engines are usually of the straight impeller vane type pump with a concentric housing to _____.

- (a) provide cooling water flow when the engine is running either ahead or astern
- (b) provide the greatest pump efficiency
- (c) prevent pump clogging from marine growth
- (d) prevent cavitation at the pump outlet

22. The lube oil cooler is located after the lube oil filter in order for _____.

- (A) the filter to operate more efficiently
- (B) the lube oil cooler to be bypassed
- (C) positive lube oil pump suction to be assured
- (D) galvanic action in the cooler to be minimized

23. A very sudden rise in pressure during combustion accompanied by knocking of the unit or detonation usually occurs

- (a) Near the end of the pressure rise after ignition of fuel charge.
- (b) Just before the fuel charge is about to ignite.
- (c) Immediately after the unit reaches peak pressure and before ignition of fuel charge.
- (d) At any stage of the combustion process.

24. The main requirements which a fuel injection system must fulfill are and state each one of the points made above are true or false

- (a) accurate metering of small amount of fuel oil.
- (b) control of quality of fuel injection
- (c) proper timing of the fuel injection
- (d) selective distribution of the fuel in the combustion space.

Ans : A, B, C (TRUE) and D (FALSE)

25. In any marine diesel engine, air movements inside a combustion chamber is very important. Generally speaking, air movement helps, State which of the above points are true or false

- (a) to distribute the fuel
- (b) to mix it with air
- (c) to cool the cylinder liner
- (d) to help in optimising liner lubrication
- (e) to assist combustion
- (f) to reduce after burning
- (g) to reduce combustion temperatures.

Ans : All true

26. Sacrificial zinc anodes are used on the saltwater side of diesel engine heat exchangers to _____.

- (A) reduce electrolytic action on heat exchanger metals
- (B) keep heat transfer surfaces shiny and clean
- (C) prevent rapid accumulation of marine growth
- (D) provide a protective coating on heat exchanger surfaces

27. The fuel supply system to an automatic auxiliary boiler, will be automatically shutdown if the boiler _____.

- (A) salinity is abnormally high
- (B) steam demand is too high
- (C) water level is abnormally low
- (D) feedwater flow is low

28. The crankcases of many diesel engines are kept under a slight vacuum to _____.

- (A) improve fuel economy
- (B) increase the air charge velocity
- (C) reduce the risk of explosion
- (D) all of the above

29. The rate of cylinder lubricating oil metered to each cylinder of a large, low-speed, main propulsion diesel engine is _____.

- (A) the same, whether at sea, or during maneuvering
- (B) adjusted during each hour of operation while at constant RPM
- (C) higher at sea than while maneuvering
- (D) lower at sea than while maneuvering

30. On a medium-speed main propulsion diesel engine, the crankpin or crank journal bearings receive lubricating oil from _____.

- (A) a spindle lubricator
- (B) an oil jet
- (C) internal splashing
- (D) drilled passages in the crankshaft

31. An auxiliary engine under load continuously fluctuates even with a steady load. The fault you diagnose could be owing to

- (a) the quality of fuel
- (b) the quality of servicing of the governor in the last port.

- (c) the supply of charge air
- (d) the overhaul of fuel injectors done in the last decarbonisation

32. In any diesel engine closed freshwater cooling system, the lowest pressure exists at the _____.

- (A) jacket water outlet
- (B) cooling water pump outlet
- (C) heat exchanger outlet
- (D) expansion tank atmospheric vent**

33. The main advantage of unit injectors over other fuel injection systems is _____.

- (a) Reducing the need of too many high pressure fuel lines**
- (b) their relatively low injection pressures
- (c) reduced wear of spray orifices
- (d) the lessened chance of fuel leaks into the engine sump

34. Cooling the intake air supplied to a diesel engine will _____.

- A. reduce mean effective pressure
- B. decrease average compression pressure
- C. decrease air charge density
- D. increase power output**

35. When there is a flame failure in an automatically fired auxiliary boiler, the _____.

- A. air supply is shut off

B. fuel supply is shut off

C. water feed is shut off

D. safety valve lifts

36. Lubrication for the main reduction gears used with diesel engines is usually supplied

by __

A. oil from the main engine sump

B. an independent lube oil system

C. the stern bearing head tank

D. the stern bearing sump tank

37. Which of the listed items should be secured before performing any maintenance on a solenoid operated air start valve?

A. Electric power

B. Lube oil standby pump

C. Hydraulic switch

D. Motor drain

38. What is to be installed on an internal combustion engine if its cylinder bore exceeds 200mm?

A. Crankcase vapor monitors

B. Engine exhaust silencers

C. Constant pressure type turbochargers

D. Explosion relief valves

39. Which of the following actions should normally be taken during each watch when the auxiliary boiler is in operation?

- A. Clean the flame scanner photocell window.
- B. Inspect and clean all solenoid valves.
- C. Lift the safety valves by hand.
- D. Inspect for oil or water leaks.**

40. Excessive vibration of an automatically fired auxiliary boiler can be caused by

_____.

- A. air or water in the furnace
- B. combustion pulses**
- C. fuel oil pump failure
- D. flame failure

41. A dirty atomizer sprayer plate in the burner of an auxiliary boiler, would be indicated by

- a. carbon on the register doors
- b. a dazzling white atomizer flame
- c. fluctuating pressure in the windbox
- d. an unevenly shaped burner flame**

42. The highest pressure in any closed diesel engine freshwater cooling system is at the

—

- (a) jacket water outlet
- (b) expansion tank inlet

- (c) heat exchanger inlet
- (d) cooling water pump outlet

43. Which of the following statements describes the function of an alarm enunciator on an engine room alarm panel?

- (a) An alarm condition causes a light and siren to come on which remain on until the machinery is secured.
- (b) A flashing light comes on, followed by an audible alarm. When an alarm acknowledge button is depressed, the audible alarm is silenced and light stays on.
- (c) An alarm condition gives an audible and visual alarm signal, both of which are secured when the alarm acknowledge button is depressed.
- (d) An alarm condition causes a flashing light to come on, followed by an audible alarm. When the alarm acknowledge button is depressed, the warning light is extinguished.

44. Excessive leakage and premature failure of valve packing is a result of

_____.

- (a) opening a valve too quickly
- (b) jamming a valve in the closed position
- (c) low pressure fluid flow through the pipeline
- (d) a scored valve stem

45. The purpose of a temperature sensing device installed in the stack of a small automatically fired auxiliary steam boiler is to secure the oil burner

_____.

- A. in the event of a flame failure
- B. in the event of a stack fire
- C. when the water level reaches the crown sheet
- D. when the feed pump discharge pressure drops to a preset minimum

46. If the combustion control system of an automatically fired auxiliary boiler fails to restart from the normal shutdown mode, you should check for _____.

- (A) broken or grounded high tension leads
- (B) a faulty ignition cable connector
- (C) an incorrect electrode setting
- (D) all of the above

47. When taking tank soundings on a ship, coating the tape with chalk helps to _____.

- (A) better identify the correct reading
- (B) show the depth of any water in an oil tank
- (C) make the tape roll easier
- (D) reduce possibility of sparks

48. When a waste heat boiler is installed in the exhaust of a main propulsion diesel engine, the exhaust gas bypass would be used _____.

- (a) at high loads to prevent overheating
- (b) at low loads to prevent corrosion in the boiler
- (c) during periods of high steam demand
- (d) when the turbocharger is in operation

49. It is desirable for an auxiliary boiler safety valve to pop open and reseal quickly to

_____.

- (a) give warning that excessive boiler pressure has been reached
- (b) prevent wire drawing of the disc and seat**
- (c) prevent valve pounding
- (d) provide sufficient blowdown

50. Which of the following statements is correct regarding grades of pipe?

- (a) Stainless steel pipe is manufactured in four general grades.
- (b) Brass pipe is manufactured in three common grades.
- (c) Copper pipe is manufactured in two common grades.**
- (d) The term "extra strong" is normally associated with schedule 160 steel pipe

51. The crankcase of many diesel engines are kept under a slight vacuum by the

_____.

- (A) scavenging action of the piston
- (B) piston type vacuum pump taking suction off a differential manometer
- (C) gland exhausting manometer
- (D) crankcase exhaust fan**

52. Lubricating oil systems for diesel engine journal bearings are usually lubricated by which of the following types of lubricating oil systems?

- (A) Splash
- (B) Gravity

(C) Pressure

(D) Bypass

53. Which of the following conditions can cause above normal air temperature to develop in the intake manifold of a four-stroke/cycle, turbocharged, diesel engine?

(A) Clogged air intake filters

(B) Piston blow-by

(C) A defective aftercooler

(D) Faulty exhaust valves

54. When may the crankcase ventilation pipes or oil drain pipes of two or more engines be connected?

(A) Propulsion engines under 1000 shaft horsepower may share a common crankcase vent provided the oil drains remain separate.

(B) In most cases it is desirable and cost effective for propulsion engines to share a common crankcase ventilation and monitoring system.

(C) No interconnection may be made between the crankcase ventilation pipes or oil drain pipes

(D) None of the above are correct.

55. Which of the following statements describes the unchecked growth of microbiological organisms within a fuel system?

(A) The dying bacteria will cause a coating to be formed on the sides of the tank thereby decreasing corrosion.

(B) The fuel in the tank will lose its fluidity, solidify, and be the cause of an expensive removal process.

(C) Corrosion of various metal components will occur due to the formation of hydrogen sulfide gas.

(D) All of the above are correct.

56. If the feed pump for an auxiliary boiler fails to deliver the feed water to the boiler, the cause may be

(A) high steam pressure in the boiler

(B) abnormally high feedwater temperature

(C) abnormally high boiler water temperature

(D) steam demand exceeding feed pump capacity

57. When lighting off an auxiliary boiler, which of the problems listed could cause the burners to sputter?

(A) Cold fuel oil

(B) Low fuel oil pressure

(C) Low atomizing steam pressure

(D) Water in the fuel oil

58. Which of the following actions takes place in the control circuit of an automatically fired auxiliary boiler when the desired steam pressure is obtained?

(a) A temperature sensing device opens the circuit breaker in the burner motor.

(b) The high limit control secures power to the entire oil firing system.

(c) The stack relay actuates the low limit control which breaks the ignition circuit.

(d) The stack relay secures power to the high voltage side of the ignition transformer.

59. Telescopic pipes to the piston of a large slow-speed main propulsion diesel engine are designed to prevent _____.

- (a) excessive crankcase pressure
- (b) excessive lube oil temperature
- (c) contamination of the lube oil by water
- (d) contamination of the cooling water by lube oil

60. Subtracting the return flow meter reading from the supply flow meter reading on a boiler equipped with a return flow fuel oil system, determines the amount of oil _____.

- (A) circulated by the system
- (B) burner throughput
- (C) returned to the settler
- (D) discharged from the pump

SECTION 3

JANUARY 2013

1. The color of the exhaust from a diesel engine should be

A. clear

B. hazy light brown

- C. hazy light blue
- D. hazy light grey
2. **In jerk type large fuel injection pumps, pulsations are absorbed by:**
- A. The fuel pump resilient foundation
- B. The high pressure pipes
- C. The shock absorbers mounted on fuel pumps
- D. The shock absorbers mounted on high pressure pipes**
3. **Which of the following can be a possible outcome of salt water contamination in fuel?**
- A. Cavitation and erosion of fuel injection components.
- B. High temperature corrosion in exhaust valves and turbochargers
- C. Unstable combustion
- D. All of the above**
4. **The water in a steaming auxiliary boiler should be tested daily for**
- A. dissolved oxygen
- B. chlorides**
- C. sludge
- D. dissolved nitrogen
5. **What fittings do you normally find in a main engine turbocharger prior to compressor inlet in the air flow path ?**

- A. Pre-filter and diffuser
- B. Pre-filter , silencer and diffuser
- C. Pre-filter , silencer and inducer**
- D. Pre-filter , silencer vibration damper

6. Unit of kinematic viscosity

- A. centipoises
- B. centistokes**
- C. CCAI
- D. none of above

7. Exhaust valve seat material

- A. stainless steel,
- B. invar,
- C. nimonic**
- D. income

8. Drop in compression pressure with high scavange box temp in a cylinder

- A. late injection
- B. early injection,
- C. worn piston ring**

D. leaky exh valve

9. Which of the following statements is true?

A. The higher the viscosity index of a lubricant, the higher is the change of viscosity with temperature.

B. The higher the viscosity index of a lubricant, the lower is the change of viscosity with temperature.

C. Viscosity index is not a measure of a fluid's change in viscosity with temperature.

D. None of the above

10. In case of cross scavenged engines :

A. The exhaust ports are located above the scavenge ports and they open everytime the piston reaches near TDC and near BDC

B. The exhaust ports are located below the scavenge ports and they open everytime the piston reaches near TDC and near BDC

C. The exhaust ports are located above the scavenge ports and they open everytime the piston reaches near BDC

D. The exhaust ports are located below the scavenge ports and they open everytime the piston reaches near BDC

11. While overhauling a piston rod stuffing box, if the butt clearance of scraper rings is found below or near the minimum, the correct remedial measure would be

A. To file the ends of the rings and increase the clearance

- B. To renew the ring set or fit new lamellae
- C. To swap the lower rings with the upper rings
- D. To renew a segment or two of ring set to obtain the desired clearance

12. In a electro- hydraulic steering gear, the movement of actuator is created by

- A. Starting the motors on both power units
- B. Operating the isolating valves
- C. Starting at least one power unit and actuating the direction valves
- D. Starting both power units and actuating the direction valves

SECTION 4

1) Friction developing between the moving parts of a governor, governor linkage and control valve will cause the governor to

- a) React with insufficient speed droop
- b) Fail to react to small speed changes
- c) Have excessive sensitivity to small speed changes
- d) Remain in the neutral position

2) A large change in ambient temperature, or using an oil of a viscosity different than the one recommended by the manufacturer in a mechanical hydraulic governor, will result in the need to adjust the

- a) pilot valve opening
- b) compensating needle valve**
- c) compensating spring tension
- d) accumulator spring tension

3) Friction, engine wear, and oil consumption in a diesel engine are directly related to the

- A) acidity of the oil
- b) Pour point of the oil
- c) Flash point of the oil
- D) viscosity of the oil**

4) When the prime movers of two paralleled generators, equipped with mechanical-hydraulic governors, are operating within their designed range, the unit with the least amount of speed drop will –

- a) pick up more of any increase in load**
- b) pick up less of any increase in load
- c) share an equal amount of any increase in load
- d) drop an equal amount of any decrease in load

5) Clearance volume scavenging in a turbocharged, four-stroke/cycle diesel engine is

accomplished

a) during the valve overlap period

b) with only the exhaust valve open

c) at a pressure below atmospheric

d) without cooling the cylinders or pistons

6) Trunk-type diesel engine pistons are most effectively cooled by heat

a) conducted through the engine block

b) conducted to water cooled cylinder walls

c) conducted through the piston crown

d) losses to escaping exhaust gasses

7) Fuel oil is injected into the cylinder of a four-stroke/cycle diesel engine during the

a) intake stroke

b) exhaust stroke

c) power stroke

d) compression stroke

8) A large, low-speed, main propulsion diesel engine uses sea water to directly cool the

a) cylinder heads

b) exhaust valves

c)scavenging air

d)injectors

9) The total starting air capacity required for reversible main engines is to be sufficient for a least

a)six consecutive starts

b)eight consecutive starts

c)ten consecutive starts

d)twelve consecutive starts

10) The light and medium fuels utilized in internal combustion engines provide a source of

a)lubrication for pistons and rings

b)food for microbiological organisms

c)gases most detrimental to the ozone layer of the atmosphere

d)all of the above

11) Which bearing half will receive the greatest load in a two-stroke/cycle diesel engine?

a)Lower half of the connecting rod bearing at the crankshaft end of the rod

b)Upper half of the main bearing

c)Lower half of the piston pin bearing in the connecting rod

d) All bearing halves share an equal load

12) Maximum lube system operating pressure for a diesel engine is normally regulated

by a/an

a) orifice in the pump suction

b) special filter design

c) pressure drop through the filter

d) relief valve

13) A naturally aspirated diesel engine at full throttle will have an intake manifold

pressure

a) slightly less than atmospheric pressure

b) approximately equal to exhaust manifold pressure at all times

c) that is widely fluctuating

d) constantly decreasing as engine load increases

14) The output pressure of a diesel engine lube oil pump is regulated by a/an

a) relief valve

b) metering valve

c) variable speed pump drive

d) orifice in the lube oil header

- 15) **An increase in the air inlet manifold pressure of a diesel engine will result in a/an**
- a) decrease in maximum cylinder pressure
 - b) increase in ignition lag
 - c) decrease in fuel consumption per horsepower-hour**
 - d) decrease in exhaust manifold pressure
- 16) **Maximum lube oil system pressure is normally controlled by**
- a) the capacity of the lube oil pump
 - b) the speed of the lube oil pump
 - c) the outlet pressure of the lube oil pump
 - d) a relief valve**
- 17) **Which of the following statements is true concerning an oil cooler?**
- a) The oil temperature is less than the cooling water temperature
 - b) The oil pressure is less than the cooling water pressure
 - c) The oil pressure is greater than the cooling water pressure**
 - d) The magnets are installed to remove metal particles
- 18) **The highest pressure in any closed diesel engine freshwater cooling system is at**
the –
- a) jacket water outlet

b)expansion tank inlet

c)heat exchanger inlet

d)cooling water pump outlet

19) Concerning diesel propelled vessels, the astern power is to provide for continuous operation astern

a)equal to that available for ahead operation

b)at 70 percent of the ahead rpm at rated speed

c)while underway and under all normal conditions

d)at 70 percent of the ahead rpm of average continuous sea speed

20) Maintaining the lowest possible scavenging air temperature at all times is not recommended due to the possibility of the

a)air charge density becoming too high

b)piston crown surfaces becoming too cold

c)formation of excessive quantities of condensate

d)compression pressure being greatly reduced

21) The nuts of main bearings, connecting rod bolts and all other moving parts are to be secured by

a)hardened steel nut locks

b)cotter pins made of spring steel

c)split pins or other effective means

d)hydraulic nuts as commonly found on large low speed engines

22) If the valve tappets in a diesel engine are set at greater clearances than those specified by the engine manufacturer, those valves will

a)open late and close early

b)open late and close late

c)fail to open when the engine is cold

d)fail to open at normal operating temperature

23) Proper lubrication of the main bearings is more easily obtained in a single acting four-stroke/cycle diesel engine than a single acting two-stroke/cycle diesel engine because

a)bearing pressure in a four-stroke/cycle single acting diesel engine is continually reversed

b)bearing pressure in a two-stroke/cycle single acting diesel engine is continually reversed

c)the maximum bearing pressure is higher in a single acting two-stroke/cycle diesel engine

d)two-stroke/cycle diesel engines require more complicated lubrication piping

24) Increasing the valve clearance between a valve stem and rocker arm, will result in the valve

- a) closing later
- b) opening sooner
- c) staying open for a shorter period of time**
- d) staying open for a longer period of time

25) Which of the following conditions can cause above normal air temperature to develop in the intake manifold of a four-stroke/cycle, turbocharged, diesel engine?

- a) Clogged air intake filters
- b) Piston blow-by
- c) A defective after cooler**
- d) Faulty exhaust valves

26) Cooling the intake air supplied to a diesel engine will

- a) reduce mean effective pressure
- b) decrease average compression pressure
- c) decrease air charge density
- d) increase power output**

27) Which of the following condition may need to be reduced when operating a large,

low-speed, main propulsion, diesel engine at low loads?-

- a) Injection pressures
- b) Control air supply pressure
- c) Cooling water flow through after coolers
- d) Lube oil temperature

28) One function of the fuel pump delivery check valve is to

- a) prevent carbon deposits from forming on the injector nozzle
- b) help the injector needle reseal without dribbling at the nozzle holes
- c) provide a prolonged pressure drop in the high pressure steel piping to the injector
- d) ensure a fuel leakoff between the plunger and barrel which provides lubrication for relative movement

29) A closed freshwater cooling system is commonly used with marine diesel engines

because the –

- a) need for water treatment is eliminated
- b) cooling water temperature differential is greater
- c) cooling water pumps are directly reversible
- d) jacket water temperature is more easily controlled

30) Fuel droplets injected into a diesel engine cylinder must have adequate penetration

to

- a) prolong the ignition delay period
- b) ensure the beginning of fuel injection
- c) thoroughly utilize the air charge
- d) allow controlled fuel combustion

31) The valve cam slope angle determines the –

- a) engine torque characteristics
- b) acceleration rate of valve opening and closing
- c) engine fuel efficiency
- d) diameter of intake and exhaust valves

32) The rate of fuel injection in a diesel engine cylinder depends primarily on

- a) the size of the holes in the fuel nozzle
- b) timing of the pump
- c) supply pressure to the pump
- d) shape of the combustion chamber

33) Which of the following devices is normally provided to prevent oil starvation in a

diesel lubrication system utilizing the "full flow" principle?

- a) Duplex strainer

b) Three-way valve

c) Pressure relief bypass line around the filter

d) Mechanical straining filter

34) A port-and-helix fuel injection pump having upper and lower plunger helices is designed to

a) vary fuel delivery and return pressure

b) vary the beginning and ending of injection

c) operate with residual fuels only

d) provide maximum fuel delivery rate

35) One advantage of hydraulic clutches over mechanical clutches in diesel engine installations is –

a) the power is transmitted at very high efficiency of 60%

b) the torsional vibrations are transmitted directly to the reduction gears

c) each clutch has a separate oil gland for reverse operation

d) no mechanical connection exists between the driving and driven elements

36) An individual injection pump is designed for variable beginning and constant ending of injection. For diesel engines operating at constant speeds, the start of injection will

a) advance as the load increases

b) retard as the load increases

c) remain unchanged regardless of load

d) always occur at top dead center

37) The amount of fuel injected in a particular time, or degree, of crankshaft rotation

is termed

a) metering

b) timing

c) rate of injection

d) rate of distribution

38) In a normally operating diesel engine, the main source of lubricating oil contamination in the crankcase is a result of the –

a) metal particles loosened by wear

b) air when no air cleaners are used

c) condensation of water vapors

d) breakdown of the lubricating oil by dilution

39) On small diesel engines, a noticeable decrease in the time interval between the replacement of the lube filter cartridge indicates –

a) piston ring blow-by

b) dirty air filter

- c)excessive oil pressure
- d)excessive oil temperature

40) When the lower edge of the spiral begins to uncover the release port in a jerk pump, the

- a)pumping continues until the plunger travels its full stroke
- b)effective pumping stroke of the plunger ends**
- c)pres. drops slowly until the full stroke is attained
- d)plunger rotates to the zero delivery position until next stroke

41) Some diesel engines are fitted with a thermometer in the cooling water outlet from each cylinder. If the cooling water temperature from all cylinders begins to rise above normal, you should suspect –

- a)increased blow-by in all cylinders
- b)incomplete combustion in all cylinders
- c)overloading in all cylinders**
- d)insufficient fuel delivery to all cylinders

42) Proper operation of the main engine reduction gear set requires the operator to monitor

- a)the sump oil level
- b)oil flow sight glasses
- c)bearing temperatures
- d)all of the above**

43) The duration of fuel injection developed by an individual port-and-helix fuel

injection pump, is determined by the –

- a)total pump stroke
- b)pump plunger diameter
- c)plunger helix angle
- d)effective pump stroke**

44) Before starting a diesel engine using an attached lube oil pump, the engineer should

- a)open the bypass line
- b)cut in the lube oil cooler
- c)pressurize the lube oil system**
- d)top off the expansion tank

45) A diesel engine using lube oil with too high a viscosity will exhibit

- a)increased starting difficulty in cold weather**
- b)increased oil consumption
- c)thickening at higher operating temperatures
- d)minimal friction losses

46) If the main propulsion diesel engine governor works irregularly with a jerking motion, a possible cause can be-

- a)a sticking fuel control linkage**
- b)a malfunctioning overload cam
- c)an unlocked overspeed trip
- d)floating valves

47) During extremely cold weather, while starting an engine, it turns too slowly and fails to start. This problem is most likely the result of

- A) High fuel oil viscosity
- b) Low fuel oil temperature
- c) High lube oil viscosity**
- d) Energized glow plugs

48) Prolonged operation of a diesel engine with a closed cooling water system, at lower than normal designed temperatures can –

- a) increase power output
- b) decrease lube oil viscosity
- c) eliminate fuel knock
- d) cause sulfuric acid formation**

49) Which of the listed governor characteristics will greatly affect the load sharing relationship between paralleled diesel generators?-

- a) Sensitivity
- b) Power
- c) Speed droop**
- d) Compensation

50) An emergency diesel generator cooling system is equipped with an automotive type thermostat. If the thermostat bellows loses its charge, the thermostat will

- a) open, and the coolant temperature will increase
- b) open, and the coolant temperature will decrease

c)close, and the engine coolant temperature will increase

d)close, and the coolant temperature will decrease

51) Fuel oil penetration into the cylinder of a diesel engine is

a)dependent on air turbulence

b)reduced by finer atomization

c)increased by finer atomization

d)non-existent in the pre combustion chamber system

52) Pre combustion chambers, air cells, and energy cells in high-speed, small bore

diesel engines all serve to increase-

a) firing pressure

b) Ignition quality of fuel

c) fuel-air ratio during compression

d) Turbulence

53). Which of the following statements best describes the operational characteristics

of an isochronous governors?-

a)they are suitable for use on main propulsion units

b)they strive to maintain a constant engine speed for all values of steady load

c)they cause a proportional drop in engine speed as the load is increased

d)they have poor sensitivity at high RPM.

54). Theoretical perfect combustion in a diesel engine yields by-products of

a)aldehydes and carbon dioxide

b)water vapour and carbon monoxide

c)nitrogen and carbon monoxide

d)water vapour and carbon dioxide

55) Combustion knock can occur in the cylinders of a diesel engine under any condition permitting-

a)a shortened ignition delay period

b)a lean fuel/air mixture

c)excess fuel in the combustion chamber

d)rapid vaporisation of injected fuel droplets

56) When excessive fuel dilution is noted in the lube oil, the oil should be-

a)centrifuged`

b)filtered

c)strained

d)changed

57) Sticking of diesel engine piston compression rings may be caused by-

a)high compression pressure

b)excessive ring action

c)excessive cylinder lubrication

d)improper ring rotation

58) When fuel is injected late into a diesel engine cylinder,

a)the exhaust will be clear

b)fuel consumption will be low

c)all the fuel will be burned at top dead center

d)fuel consumption will be high

59) ME LO inlet temperature should be—

a)40C

b)50C

c)60C

d)55C

60) Exhaust temp of one ME cylinder high could mean

a)fuel valves need overhaul

b)exh valve leakage

c)piston ring blow past

d)all of above

61)For a 2 stroke engine with exhaust ports—

a)scavenge ports close before exhaust ports

b)exhaust ports close before scavenge ports

c)scavenge ports and exhaust ports close at same time before BDC

d)scavenge ports and exhaust ports close at same time after BDC

62)For a 2 stroke engine with exhaust valves—

a) Scavenge valve closes before exhaust ports

b) Exhaust valves close before scavenge valves

c) Scavenge and exhaust valves close at same time before BDC

d) Scavenge and exhaust valves close at same time after BDC

63) The maximum amount of liner wear occurs at—

a)top of liner

b)1/ 3 downward from top centre

c)midway

d)bottom of liner

64) Which of the following cannot be removed from fuel oil by centrifuging in the purifier and micro-filtration

a)sodium

b)aluminium and silicon

c)vanadium

d)ash

65)In the preheater before purifier the recommended heavy oil preheat is-

a)85C

b)98C

c)110C

d)120c

66)For a ME which has a 5 micron fuel filter, a homogenizer (omega fire) is usually fitted –

a)before the purifier

b)after the purifier

c)after the 5 micron filter to ME

d)before the horizontal clarifier

67)For a main engine fuel system which has a 5 micron filter ,a super decanter is usually

fitted—

- a)before the purifier
- b)after the purifier
- c)after the 5 micron filter to ME
- d)before the horizontal clarifier

68)For low sulphur 380 cst fuels the TBN of MECC oil should be in the region of—

- a)20
- b)40
- c)60
- d)70

69)Using a MECC oil of high TBN can cause—

- a)improper centrifuging of water
- b)Calcium laquer deposits on bearings
- c)sludge formation with water in ME sump
- d)all of above

70)When using a high TBN MECYL oil and suddenly the ship has to use low sulphur 380

cst HO in the ME, due to SECA area entry—

- a)reduce the feed of MECYL
- b)increase the feed of MECYL
- c)do not change the feed rate
- d)increase the TBN of the MECYL

71)ME scavenge air temperature is adjusted by-

- a)controlling the sea water inlet
- b)controlling the sea water outlet**
- c)keeping outlet valve 100% open always.
- d)none of above

72)The ME jacket FW cooling outlet temperature is-

- a)80C**
- b)95C
- c)50C
- d)55C

73)The scavenge air high temperature set point for 2 stroke ME is

- a)40C
- b)55C**
- c)65C
- d)35C

74) You see white smoke coming from the ME funnel stack, this could be

- a)one or more cylinders not getting enough fuel
- b)too low compression pressure
- c)water in fuel**
- d)all of above

75)The crank angles of a 2 stroke engine are—

- a)2 cylinder engine/ 90 degrees
- b)4 cylinder engine/ 60 degrees

c)6 cylinder engine/ 90 degrees

d)4 cylinder engine/ 90 degrees

76)Crankcase explosions of main engines can be due to-

a)over heating of MECC oil

b)poor condition of liners/ rings

c)crankshaft / thrust bearing failure

d) all of above

77)If there is air in the fuel oil filter, the compression and re expansion of air will—

a)not allow the fuel injection valve to close

b)not allow the fuel injection valve to open

c)makes no difference

d)none of the above

78) Which of the bearings listed are most widely used for the main and connected rod bearings of a diesel engine?

a)roller

b)sleeve

c)precision insert

d)needle

79) Which of the following methods is normally used to lubricate bearings in a small high-speed diesel engine?

a)splash lubrication

b)pressure lubrication

- c)sight feed lubricators
- d)mechanical lubricators

80) In a naturally aspirated diesel engine, the volume of air intake is directly related to engine

- a)compression ratio
- b)valve size**
- c)fuel pressure
- d)cylinder clearance volume

81) In a bypass filtering system for a medium or high speed diesel engine, the lube oil bypassing the filter

- a)returns directly to the suction side of the pump
- b)returns directly to the sump
- c)flows to the engine bearings**
- d)flows through a second-stage strainer, reheater, and returns to the sump

82) In a diesel engine, the main bearings are used between the

- a)connecting rod and the crankshaft
- b)wrist pin and the connecting rod
- c)camshaft and the engine block
- d)crankshaft and the engine block**

83) Heat exchangers are most commonly found in a small auxiliary diesel engine

- a)fuel oil system
- b)governing system

c)air starting system

d)lube oil system

84) Multiple concentric valve springs are often used with diesel engine valves to

a)enable research and development of cam contour to be simplified

b)operate the valve gear where the larger force is required, but space limitations restrict use of a large spring

c)allow for easier valve replacement

d)enable a total smaller valve spring force to keep the valve tight on its seat

85) Which of the listed bearing installations is subjected to swinging motion?

a)crankshaft journal

b)crankpin bearings

c)wrist pin bearings

d)thrust bearings

86) One advantage of vacuum feed type cylinder lubricators over the liquid sight type is-

a)there are fewer moving parts

b)adjustment is not required

c)better metering accuracy

d)a lower grade of oil may be used

87) Cooling water pumps driven by direct reversing diesel engines are usually of the straight impeller vane type -pump with a concentric housing to

a)provide cooling water flow when the engine is running either ahead or aster

- b) provide the greatest pump efficiency
- c) prevent pump clogging from marine growth
- d) prevent cavitation at the pump outlet

88) Motor vessels usually have an independent lube oil system each for the main engine and main reduction gears because

- a) coolers are not needed for the gear system
- b) contaminants produced by the engine could harm the reduction gears**
- c) non additive oils are used in the main engine system
- d) different type centrifuges are required for the main engine and reduction gear lube systems

89) Which of the bearings listed is most widely used for main and connecting rod bearings of modern diesel engines?

- a) Steel-lined
- b) Poured babbitt, self-aligning
- c) Split roller
- d) Precision insert**

90) Directional intake ports in diesel engines are used to

- a) reduce air charge turbulence
- b) induce air swirl**
- c) deflect hot combustion gas away from the valves
- d) oppose the effects of piston induced squish

91) Diesel engine main and connecting rod precision bearings are made in halves.

Each half exceeds one-half the bearing circumference by a small amount. The small amount is termed

- a)clearance
- b)crush**
- c)pitch
- d)thrust

92) The piston rod scraper box incorporated in a single acting two-stroke/cycle, crosshead diesel engine serves to

- a)eliminate the necessity for an oil scraper ring
- b)prevent side thrust and cylinder scoring
- c)prevent sludge and dirty oil from entering the crankcase**
- d)scrape oil and carbon deposits off the cylinder walls

93) The proper location for journal bearing oil grooves is

- a)in the region of the load bearing surface
- b)as a side relief where the two shells meet**
- c)at the bottom of the bearing
- d)halfway between bottom and where shells meet

94) How are hydraulic valve lash adjusters on diesel engine rocker arm assemblies lubricated?

- a)Cup-fed grease
- b)Sealed self-lubricators
- c)Metered hydraulic oil supply

d) Forced lube oil supply

95) Main propulsion diesel engines having a bore exceeding 300 mm are to have at least

a) two independent means of starting the engine

b) five air starting valves to permit the admission of starting air at any crank angle

c) one (explosion relief) valve at the position of each main crank throw

d) two engine driven lube oil pumps capable of parallel operation

96) Integral water jacket liners use O-rings near the bottom of the liner, these O-rings serve to

a) form a water seal between the liner and engine block

b) allow for slight misalignment of the liner

c) prevent the escape of lubricating oil from the crankcase

d) ensure proper temperature flow between the liner and engine block

97) Telescopic pipes to the piston of a large slow-speed main propulsion diesel engine are designed to prevent

a) excessive crankcase pressure

b) excessive lube oil temperature

c) contamination of the lube oil by water

d) contamination of the cooling water by lube oil

98) A characteristic of a bearing material which permits small dirt particles to become embedded in the surface & is

a) desirable, as it will prevent damage to the journal surface

- b)desirable, as it will assist in keeping the lube oil filters clean
- c)undesirable, since the embedded particles will score the journal
- d)undesirable, since the particles will interfere with lube oil flow

99) Most fuel injection nozzles are opened by

- a)fuel oil pressure**
- b)a cam operated follower
- c)a spring-loaded pressure plate
- d)timing gears keyed to the crankshaft

100) Which of the following devices controls the discharge flow rate of an attached, positive displacement, rotary gear, diesel engine, lube oil pump?

- a)A pressure regulating valve
- b)A pressure relief valve
- c)The engine speed**
- d)An orifice

101) The expansion tank for a diesel engine closed cooling system is designed to maintain a constant head on the system and

- a)reduce water temperature
- b)reduce water turbulence
- c)provide an air cushion
- d)allow for an increase in water volume as the engine warms up**

102) To minimize corrosion, fuel oil strainer disks, spacers and scraper blades are made of

- a)brass
- b)copper
- c)iron
- d)monel metal or stainless steel**

103) Which of the following statements describes the function of an expansion tank in a diesel engine cooling system?

- a)Maintains a constant head on the system
- b)Reduces the air cock when fires are lighted
- c)Provides a low pressure point for the addition of makeup cooling water
- d)All of the above**

104) On a large diesel engine installation, crankshaft axial alignment is maintained by the

- a)piston rod guides
- b)engine thrust bearing**
- c)crosshead bearing
- d)main shaft flexible coupling

105) Scavenging in a four-stroke/cycle diesel engine occurs during the

- a)last part of the exhaust stroke, and the first part of the intake stroke**
- b)last part of the intake stroke only
- c)early part of the injection stroke only
- d)early part of the power stroke

106) In a large, slow-speed, main propulsion diesel engine, which of the parts listed is

under tension when the engine is running?

- a) Bed plate
- b) Column
- c) Entablature
- d) Tie rod

107) The lube oil cooler is located after the lube oil filter in order for

- a) the filter to operate more efficiently
- b) the lube oil cooler to be bypassed
- c) positive lube oil pump suction to be assured
- d) galvanic action in the cooler to be minimized

108) In two-stroke/cycle diesel engine, the process of scavenging begins as the

- a) piston nears and passes TDC
- b) early part of the upstroke
- c) piston passes BDC
- d) early part of the downstroke

109) With respect to flow of lubricating oil through a diesel engine, the lube oil coolers are located after filters in order to

- a) allow filtration of less viscous oil
- b) decrease the pressure drop across the filter
- c) improve overall filtration
- d) all of the above

110) Passages are drilled in the crankshafts of diesel engines to provide lubricating oil

to the

- a)main bearings
- b)connecting rod bearings
- c)piston pin bushings
- d)All of the above

111) The outlet from an expansion tank of a closed freshwater cooling system should

be piped to the-

- a)cylinder head water outlet header
- b)cylinder jacket inlet main
- c)heat exchanger inlet connection
- d)jacket water pump suction line

112) The intake valves in diesel engine are reseated by

- a)cam followers
- b)push rods
- c)combustion gases
- d)valve springs

113) Small amounts of moisture are necessary to trigger the growth of microbiological organisms found in some marine fuels. Some sources of water contamination are

- a)tank surface leakage
- b)humidity and condensation
- c)improper tank washing procedures
- d)All of the above

114) The main function of tie rods in the construction of large, low speed diesel engines is to

a)stiffen the bedplate in way of the main bearings to increase the engine`s longitudinal strength

b)accept most of the tensile loading that results from the firing forces developed during operation

c)mount the engine frame securely to the hull to prevent shaft coupling misalignment

d)connect the crosshead solidly to the piston rod

115) On most modern diesel engines,the main and connecting rod bearings receive their lubricating oil by –

a)banjo feed

b)splash feed

c)gravity feed

d)pressure feed

116) A unit type fuel injector is used on a diesel engine to

a)meter the fuel

b)produce the proper fuel oil pressure

c)atomize the fuel

d)all of the above

117) Lubricating system for diesel engines are usually designed to initially provide lube oil to the engine-

a)camshaft bearings

b)main bearings

c)piston crowns

d)cylinder walls

118) Mechanical lubricators for diesel engine cylinders are usually small reciprocating pumps which are-

a)operated manually once each hour

b)operated until the engine has started

c)placed into operation only at maximum load

d)adjustable to meet lubrication requirements

119) Shaker, circulation, and spray are the three general methods used in

a)pre-injection fuel oil treatment

b)lube oil filtration

c)fuel oil purification

d)piston cooling

120) Fuel injector nozzles are usually of the multi-orifice type with the number and placement of the holes arranged according to the

a)type of piston rings

b)pressure of the fuel system

c)size of the pump plunger spring

d)design of the combustion chamber

121) What is the crank angle between any two crank throws in the firing order of a four-stroke/cycle, in line, eight cylinder diesel engine?

- a)45° b)60° **c)90°** d)100°

122) The main reason counterweights are added to crankshafts is to

- a)reduce piston side thrust
b)reduce crankshaft end thrust
c)provide uniform loading and wear of main bearings
d)increase the strength of the crank webs

123) A viscous damper, as used on a marine diesel, is a sealed precision built device which dampens the torsional vibrations in the

- a)camshaft
b)flywheel
c)crankshaft
d)thrust shaft

124) A crankshaft whose center of gravity coincides with its center line is said to be

- a)dynamically balanced
b)statically balanced
c)counter balanced
d)resonantly balanced

125) The possibility of damage from operating a diesel engine at critical speeds is reduced by the use of

- a)an isochronous governor
b)elastic engine mounts
c)a vibration damper

d)a cast iron bed plate with good flexible qualities

126). In a diesel engine lube oil system, which of the following parts should be lubricated first?

a)Camshaft bearings

b)Main bearings

c)Piston crowns

d)Cylinder walls

127) When fuel oil heaters are required for engine operation,

a)each heater shall have the capacity to supply the main engine at full power

b)at least two heaters of approximately equal size are to be installed

c)the system shall be designed to permit series or parallel operation

d)none of the above

128) An advantage of aluminium pistons compared to cast iron pistons is:

a)greater high temperature strength

b)better heat conductivity

c)greater weight per cubic cm

d)increased resistance to wear

129) Which engine component increases air density and helps to improve engine operating efficiency?-

a)impeller

b)compressor

c)aftercooler

d)exhaust diffuser

130) An electric heater built into the cylinder water jacket would be used to

a)raise lube oil viscosity for easier starting in cold weather

b)increase air inlet temperature

c)increase compression ratio

d)increase water temperature for easier starting in cold weather

131) Which is found with both mechanical and hydraulic governors?

a)direct linkage between the ball head and fuel rack

b)a servomotor

c)a compensating device

d)flyweights

132) Which of the following design features will reduce the possibility of overheating the top compression rings of a cast iron piston?

a)The top ring is located as close to the piston as possible

b)The inside surface of the piston head is rounded into the ring belt

c)A nickel-bearing insert is cast into the top ring groove

d)A heat dam design is sometimes used in the piston head

133) The purpose of heat dam used in some diesel engine cast iron pistons is to

a)concentrate all heat in the piston crown

b)increase the distance of travel for heat from the crown to the top ring groove

c)ensure that all heat in the piston crowns is conducted to the top ring

d)provide a short direct path for heat to flow from the crown to the top ring

134) Valves used in diesel engine fuel oil pressure piping are to be

- a) installed to close against flow or so constructed as to permit packing under pressure.
- b) solenoid released upon the failure of engine lubrication
- c) either of the gate or globe valve type
- d) forged constructed under the approval of the Marine Inspector

135). Cast iron pistons used in large propulsion engines are constructed with

- a) no taper whatsoever
- b) the skirt being tapered and smaller than the crown
- c) the skirt being tapered and larger than the crown
- d) the crown being tapered and smaller than the skirt

136) The diameter of a piston is usually less at the crown than at the skirt, in order to

- a) facilitate the installation of piston rings
- b) allow for the expansion of the piston during operation
- c) prevent crankcase vapors from entering the combustion chamber
- d) reduce wearing of the upper cylinder liner

137). Which of the following manufacturing methods is recommended for diesel engine fuel injection line piping?-

- a) Cold rolled
- b) Electric resistance welded
- c) Seamless drawn
- d) Straight seam

138) Exhaust pipes of multiple engine installations are not to be interconnected, but

are to be run separately to the atmosphere

- a) unless arranged to prevent the return of gases to an idle engine
- b) to a point not lower than the highest load line
- c) at a location segregated from other ventilation systems
- d) and shall be protected by a rain guard or similar device

139) Which of the bearing types listed is most commonly used in smaller vessel main propulsion reduction gears as thrust bearings?

- a) ball bearings
- b) poured bearings
- c) sleeved bearings
- d) tapered roller bearings

140) The main reason for using bimetallic piston rings is to

- a) increase engine thermal efficiency
- b) reduce specific fuel consumption
- c) reduce the probability of ring fracture
- d) allow for ring expansion

141) A spring-loaded centrifugal flyweight governor responds to reduced engine load with an immediate increase in

- A) Pilot valve oil pressure
- b) Speeder spring force
- c) compensation needle valve clearance
- D) centrifugal force on the flyweights

142) The reason why the pneumatic reversible roller guide of fuel pump could oscillate is

- a) incorrect clearance in the air cylinder guideway/ reverse arm bushing
- b) too large air pressure drop
- c) insufficient air supply
- d) all of above

143) Reasons for exhaust valve hammering could be-

- a) deficiency in oil supply
- b) errors in air spring
- c) excessive leakage in the HP oil system
- d) all of above

144) error in the air spring system causing exhaust valve hammer can be due to—

- a) air pressure too high
- b) maladjusted safety/ drain valve
- c) supply pressure not corresponding with safety valve opening pressure
- d) all of above

145) deficiency in oil supply causing exhaust valve hammering can be due to-

- a) foaming oil due to air leak at pump suction
- b) too low oil supply pressure
- c) too high oil temperature (MECC) causing low viscosity
- d) all of above

146) excessive difference between combustion pressure and compression pressure in a

ME cylinder can be due to-

- a) low scavenge air pressure
- b) change in exhaust valve timing
- c) burnt exhaust valves
- d) all of above**

147) the difference between water washing and dry cleaning the TC turbine is

- a) there is no difference one is wet, the other is dry
- b) wet washing requires reduced load**
- c) dry cleaning requires reduced load
- d) none of the above

148) oscillations of pneumatic reversible roller guide for fuel pump can cause-

- a) mechanical damage to air cylinder
- b) leakages on maneuvering air
- c) loss of engine maneuverability
- d) all of above**

149) During maneuvering the MECYL feed rate is usually

- a) 125% of service feed rate**
- b) 50%
- c) 200%
- d) 300%

150) The difference between the max combustion pressure and compression pressure in a

2 stroke engine cylinder unit is

a)40 bars

b)10 bars

c)70 bars

d)65 bars

151) The air spring pressure to prevent ME exhaust valve hammer is in the region of—

a)2 kg

b)7kg

c)12 kg

d)14 kg

152. Your indicator diagram from one of the main engine cylinders is shown. P Comp normal, P Max is low--What kind of steps do you think is necessary to rectify the failure?

A Check fuel injector valve, fuel injection timing, fuel pump suction valve and fuel pump lead

B Clean air cooler and turbocharger air cooler

C Adjust fuel pump lead only during operation

D Increase fuel pump setting.

153. Your indicator diagram is as shown. What kind of steps do you think are necessary to rectify the failure? Pc normal pm high

A Check if fuel injection is too early or fuel pump lead too large

B Check if fuel injection valve is correctly by adjusted.

C Check that you have correctly viscosity/fuel preheating.

D Replace the fuel valve.

154. A drawn indicator diagram from one of the main engine cylinders is as shown. What kind of steps are necessary to rectify the failure?—pc and pm both low

A Overhaul the unit to determine faults such as: piston ring blow-by, exhaust valve malfunction, clogged scavenging ports, delayed ignition etc.

B Adjust fuel pump lead to inject more fuel so as to maintain power balance

C Change fuel injection valve

D Check fuel pump safety valve.

155. During inspection of piston and liners through scavenging ports, piston rings on all units were found as shown (micro seizure). The best way to stop its progress is:

A Increase cylinder oil consumption, determine fuel quality and readjust the fuel oil purifiers

B Increase cylinder oil consumption

C Replace all piston rings

D Run engine at lower load.

156. During inspection and calibration of one unit, you observe the situation shown. The conclusion is clover leafing. The main engine uses high grade TBN cylinder oil. What do you have to do in order to reduce wear?—depression on either side of all lub orifices—like 10 paise coin

A Decrease jacket cooling water temperature to avoid heat stress

B Increase the jacket cooling water temperature to avoid the sulphur dew point

C Increase cylinder oil consumption to neutralize the sulphur

D Contact engine maker for advice.

157. Your vessel is entering a tropical area and high humidity is expected. To avoid condensation in the main engine's air cooler, it is recommended to:

- A Operate the engine with slightly open drain cocks, scavenging to get rid of the water
- B Reduce speed.
- C Decrease the air temperature so proper draining can be achieved from the air cooler
- D Increase scavenging air temperature to above dew point**

158. During inspection of the crank bearing for one of the units in the main engine, the bearing shell was found as follows: Surface of the white metal was black and very hard. Patches of black incrustations have worn grooves in the journal. What was the cause?

- A Dirt in the lubricating oil
- B Wrong casting of bearing shell
- C Water in the lubricating oil during service**
- D Bearing shell service time exceeded.

159. When carrying out piston overhaul, it is important to clean the ring grooves properly. Why?

- A To make sure gas pressure can enter freely on top of and behind the piston ring**
- B To make the rings fit in the groove
- C All rings must be changed to maintain a perfect sealing
- D That piston rings can move freely in the grooves.

160. During operation of the main engine, the exhaust temperature increases on one of the cylinders. The turbocharger starts surging and smoke from the turbocharger inlet air filter occurs. What is the probable cause?

- A High back pressure in the exhaust system
- B) Turbocharger failure
- C Fuel valve stick in open position.
- D Scavenge box fire**

161. You are having a blow-by on the main engine, but due to the circumstances, it is impossible to stop and do a piston overhaul. What is the correct action to take?

- A Reduce speed.
- B No action necessary.
- C Reduce speed temporarily and increase cylinder oil consumption.**
- D Increase cylinder oil consumption.

162. You have installed a new bearing in the main engine. What is the necessary action to take in the running-in period?

- A Stop after 30 min. running to hand feel the bearing.
- B Allowance must be made for a running-in period with reduced speed and careful temperature monitoring.**
- C No necessary steps to be taken.
- D Allow for 1 hr. running with appropriate temperature monitoring of the bearing.

163. You are experiencing large hunting on the fresh water cooling system. What is the reason?

- A The fresh water circulating pump is worn out.
- B The cooling water temperature is too low.
- C You have a cracked liner, or cover.**

D The expansion tank is empty.

164. Why is it important to check the timing on the cylinder oil lubricators?

A To avoid high temperature in the combustion chamber.

B To get the right amount of oil into the cylinder.

C To get the oil into the cylinder when the piston is in the right position

D To avoid excess lubrication.

165. Why do we use cylinder oil?

A To neutralize the sulphur and get a lubricating oil film between piston rings and liner.

B To get a lubricating oil film between piston rings and liner.

C To neutralize the sulphur in the fuel.

D To avoid blowby.

166. How large a deviation in opening pressure can be accepted in a diesel engine injection valve?

A 15 kg/cm²

B 40 kg

C 50 kg

D 70 kg

167. What will the effect be, if you have a fuel injector valve that is dripping after the injection is finished ?

A Less carbonizing.

B Damage to piston and liner.

C Greater output of the engine.

D Better combustion.

168. How is the quantity of fuel oil, in HP fuel oil pump adjusted when the engine is running ?

A By adjustment of the pressure valve in the pump.

B By adjusting the length of the pump stroke.

C Turning the plunger piston according to engine load

D Adjusting oil flow to the HP fuel oil pump.

169. When a changeover from HFO to diesel oil is going to take place, we want this to be carried out as follows

A as fast as possible to save HFO.

B as fast as possible to save steam.

C as quick as possible, to obtain a fast temperature reduction to cool the HP fuel pumps.

D slow to get slow cooling.

170. If you are going to enter the engines crankcase (go inside), how will you secure the engine after you have closed the main starting air valve ?

A Engage the turning gear on the engine.

B Close absolutely all valves on the starting air bottle.

C Close the instrument air supply.

D Keep a man posted in the control room to watch that nobody tries to start the engine

171. If you get a heavy scavenging air fire, which one of the following part is likely to take the most serious damage ?

A Stuffing box.

- B Exhaust valve.
- C Piston.
- D Crosshead bearing.

172. Why are we blowing the engine before start (slow turning on air) ?

- A To be sure that we do not have water collected in the cylinders.
- B To be sure that no parts are loose, or that the engine is blocked from rotation.
- C To get fresh air into cylinders ensuring a safe start of the engine.
- D To be sure that all indicator cocks are closed, and no passage into the combustion chamber.

173. The cylinder oil for FO with high sulphur content is supposed to be:

- A acidic.
- B Alkaline
- C neutral.
- D does not matter.

174. A 2 stroke engine is usually equipped with an auxiliary blower fan, which is supposed to be used:-

- A continuously, together with the turbochargers to ensure enough air to the engine during full speed running.
- B during continuously reduced speed under a longer sea voyage.
- C during manoeuvre and manoeuvre speed condition (arrival and departure)
- D during a scavenging fire, to help put out the fire.

175. What do you consider as the most important task after a piston job ?

A A search inside the crankcase for tools and rags.

B Starting the auxillary blower to ventilate the scavenging belt, and the cylinder liners, to ensure that the engine has sufficient fresh air for starting.

C Patch up destroyed paint work on the crankcase doors.

D Starting the engine to see that it rotates

176. Why is it so important to keep the lub oil viscosity within safe limits?

A To keep the oil protective film between moving metal surfaces .

B The luboil viscosity has no influence on the oil's lubrication ability.

C To keep the additives in good condition.

D It is not important

177. Total Base Number (TBN) is important as a measure of neutralizing ability against strong Acids. What will You do if this TBN base number is reduced to a low level?-

A Renew lub oil in the system.

B Send one lub oil sample to new analysis.

C Nothing.

D Purify the oil system.

178. What can happen with a lub. oil cooled piston if you stop the lub. oil pump immediately after You stop the engine?

A Nothing happens.

B The oil flashpoint will be changed.

C Overheating of the piston, and oil coke deposits in the cooling chambers

D You save the oil sealings in the piston.

179. You have checked the oil viscosity in an auxiliary engine with the viscosity test kit.

The result shows that the viscosity is high. What will you do?

A Decrease the cooling water temperature for the oil.

B Clean the system and change the oil

C Increase the cooling water temperature for the oil.

D Increase the lub oil pressure.

180. You have checked the oil viscosity in an auxiliary engine with the viscosity test kit.

The result shows that the viscosity is low. What will you do?

A Clean the system and change the oil.

B Increase the oil temperature.

C Start to purify the oil.

D Decrease the oil temperature.

181. What could be the reason if the lub oil viscosity increase?

A Heavy fuel oil leakage to the lub oil system.

B The lub oil viscosity will not increase.

C. Water-leakage to the lub oil system

D High lub oil temperature.

182. What could be the reason if the lub oil viscosity decrease?

A Heavy fuel oil leakage to the lub oil system.

B Diesel oil leakage to the lub oil system

C Low lub oil temperature.

D Wrong lub oil pressure

183. A water content greater than 2 % is detected in a lub oil system. What is the best action to do?

A Continuous purifying the system with the lub oil pumps running.

B Boil out the water by increasing the temperature.

C Segregate the oil in a separate tank for continuous purifying.

D It is no danger before the water level reach 6-8%.

184. What long term effect will excessively high temperature have on lubricating oil quality?

A Cause oxidation which reduce viscosity.

B Evaporates the oil giving high consumption.

C The oil flashpoint will be changed.

D Cause oxidation which increase viscosity.

185. Which would be the most suitable place to obtain an oil sample for analysis?

A From the lub. oil pump suction line.

B From the system pipeline

C From the oil cooler drain.

D From the filter drain.

186. If water contamination occurs in the crankcase oil of an auxiliary engine the oil viscosity will:-

A Increase.

B Nothing happens.

C Stay at the same.

D Decrease.

187. What type of lubricating oils are generally used in auxiliary engines?

A Detergent.

B Alkaline.

C Synthetic.

D It is not important.

188. In a Burmeister & Wain main engine, at what point is cylinder oil injected?

A Just before "Top Dead Centre".

B As the piston passes "The Lubrication Points" in a downward direction

C As the piston passes "The Lubrication Points" in an upward direction

D Just before "Bottom Dead Centre"

189. What differential pressure would you expect to find across an engine lub.oil filter?

A 1.2 Bar

B 3.0 Bar

C Zero

D 0.2 Bar

190. You notice the sump level in an engine has increased and no new oil has been added.

What action would you take?

A Drain some oil from the engine.

B Stop the engine and look for a fuel or water leak.

C Reduced the load, and look after fuel or water leak.

D Leave it the same.

191. Oil analysis results show a high level of tin. What could be the cause of this?

A Bearing damage.

B Water contamination.

C Fuel contamination

D Too high lub.oil temperature.

192. We have two kinds of turbocharging systems: constant pressure and impulse. The difference between these two can be found in:

A The exhaust gas receiver.

B Scavenging air coolers.

C The blades on the exhaust gas turbine.

D The scavenging valves of the engine.

193. We have a problem with surging in the turbocharger. Which of the following could be the cause?

A Worn out bearings on the turbocharger.

B The lubrication oil pump is malfunctioning.

C Dirty rotor blades.

D Dirty scavenging air cooler on the air side.

194. The revolutions on the turbocharger have increased during the night with unmanned engine. Could this be caused by:

A The viscosity of the fuel is to high .

B We have favourable winds and current.

C The current and wind are holding the vessel back

D Poor combustion due to malfunction of fuel valves

195. The turbocharger (constant pressure) is making "whoofing" noises. What might be the cause?

A Heavy seas from behind.

B A faulty turbocharger bearing.

C One or more leaking exhaust-valve(s).

D Strong current against

196. After how many hours would you consider changing the turbocharger bearings, even though all appears to be normal?

12.000 hours.

B 4.000 hours.

C 25.000 hours.

D 30.000 hours.

197. The timing of the engine is delayed. The exhaust temperatures are high. How would you expect this to affect the turbocharger?

A Decreased turbocharger revolutions.

B Surging of the turbocharger.

C Increased turbocharger revolutions

D Higher air and gas temperature after turbocharger.

198. We have a problem with vibration in the turbocharger. What might be the cause?

A Dirty air inlet filter.

B The turbine rotor is not balanced

C The lubricating oil needs to be changed.

D Worn out turbocharger bearings.

199. With full load on the main engine, the RPM for the turbocharger is too low. What may cause this?

A. The diffuser ring is damaged.

B. Exhaust temperatures on the main engine are too high.

C. Dirty nozzle ring.

D. The lubricating oil pump is malfunctioning.

200. with full load on the main engine, the turbocharger tachometer reads: Too low RPM.

Why?

A. Damaged connection between pick-up and tachometer unit

B. Pick up is not connected to turbocharger.

C. Turbocharger need to be cleaned/overhauled.

D. Pick up for tachometer is wrongly adjusted.

201. The lubricating oil on the exhaust side of the turbine blower gets very dirty after only a few hours in service. What can the reason be?

A. Exhaust gas leaking into the oil chamber

B. Wrong type of oil used.

C. Lubricating oil is mixed with salt water

D. Worn out bearing turbine side

202. After water-washing the turbocharger exhaust side, the blower starts to vibrate.

What has happened?-

- A. Water drain for washing system is clogged.
- B. Foundation bolts for the blower unit are loose
- C. The rotor blades are damaged or the blades are not properly cleaned**
- D. Inlet filter partly clogged.

203.The blower's air delivery is not sufficient. What is the cause?

- A. Air temperature in engine room too high.
- B. Dirty scavenge duct.
- C. Clogged air inlet filter.**
- D. Cooling water temperature too high

204.Why is it important to slow down the main engine RPM while water-washing the turbocharger?

- A. To protect the bearings .
- B. To protect the exhaust gas economizer.
- C. To protect the blower side .
- D. Not to damage the rotor blades.**

205.Some engine manufacturers recommend that washing of the compressor side is not carried out. Is this due to:

A Greasy sludge from the compressor sticking between the fins in the air coolers, necessitating extra cleaning of these.

B Large volumes of water being carried over into the cylinders of the engine.

C The nozzle ring becoming corroded

D The thermal shock exhibited by the vanes.

206. What is the meaning of the term "valve clearance"?

A The clearance between the rocker arm and valve pushrod.

B The clearance between valve spindle disc and seat.

C The clearance between the rocker arm and camshaft pushrod.

D The clearance between the rocker arm and valve pushrod in either warm or cold state.

207. The meaning of lapping a valve and valve seat is:

A Adjust the overlapping of the inlet and exhaust valves.

B Grind the valve against the valve seat to obtain a uniform sealing surface.

C Machining the valve in a lathe machine.

D Repair by welding.

208. Some 4-stroke engines are fitted with a rotorcap on the cylinder head valves. For what reason?

A Rotate the inlet valve during operation.

B Distribute the exhaust gas or the air inlet better to improve combustion.

C Improve the scaling surface function, increase the service time of the exhaust valve in the engine

D To prevent the valve spindle from sticking..

209. When overhauling the cylinder covers on a modern 4-stroke engine, is it important not to interchange inlet and exhaust valves?

A Not so important.

B Important due to different material and working conditions.

C Can be changed if same size.

D Important due to different type size valve guide.

210. What is the purpose of the cylinder head safety valve?

A To relieve excessive high pressure in the cylinder to protect the engine from being damaged.

B To adjust the cylinder pressure to a safe working pressure.

C A valve for safety stop (emergency) of the engine.

D For indication of engine being overloaded.

211. Most of the engine makers recommend to change the cylinder head gaskets each time a piston overhaul is carried out. Why?

A To obtain a proper sealing and correct distance between piston and cover in TDC position.

B To increase the consumption of parts so they can make more money.

C To avoid heat transfer to the cylinder head.

D To be granted a proper sealing with a new gasket.

212. Some 4-stroke engines are equipped with cooled fuel valves. Why is it so important to keep the coolant's temperature correct?

A For cooling only.

B For preheating only

C To avoid overheating the fuel nozzle

D For cooling and to maintain correct viscosity on the fuel when injected

SECTION 5**1. Which is true?**

- a. Rotary vane steering gear generally operates at high oil pressure than RAM type
- b. $RT > RV$
- c. $RT = RV$
- d. None of the above

2. Which part of the liner wear due to catalytic fines in fuel

- a. Upper part

3. Besides raising the liner wall temperature to sulphur corrosion

- a. Increase cylinder feed
- b. Increase scavenge air temperature
- c. Improved separation of water
- d. All the above

4. Functions of attemperator

- a. Increase boiler feed water temperature
- b. Decrease super heated steam out temp and protect secondary stage superheat
- c. Control super heat steam out temp and protect secondary stage superheat
- d. Increase the combustion air temperature

5. Resin chokes

- a. Better vibration damping
- b. Better compressive strength
- c. Unaffected by fuel oil and sea water chemicals
- d. None of the above.

6. Exhaust grouping in main engine

- a. Better starting
- b. No need for auxiliary blowers
- c. Pure prime

7. No change in speed in governor

- a. Fine
- b. Coarse
- c. Isochronous
- d. Unichronous

8. Crank case ventilation for function as

- a. Prevent acc. Of combustion gases
- b. Temp. links oil loading

9. In a fully built or semi built type crankshaft, how can any slippage at shrink fit be identified?

- A. By inspecting the locking arrangement provided
- B. By checking the dowel provided.
- C. By checking the witness mark provided for reference .

D. By checking the performance of the engine

10. The flow rate through a F.O. transfer pump will not be affected by which of the following factors?

- A. Low F.O. temperature
- B. Low sounding in F.O. tank
- C. Internal leakage within the pump
- D. Leaking discharge valve**

11. The use of ball and roller bearings in internal combustion engines is becoming more and more popular for some or all of the following

- (a) The low coefficient of friction
- (b) The absence of wear under favorable conditions
- (c) The independence in lubrication
- (d) The extreme reliability of such bearings**

12. 2 stroke exhaust valve rotates by

- a. rotocap
- b. vanes**

13. Sulphur and vanadium in F.O

- A. Hot corrosion**
- B. Cold corrosion
- C. Caustic corrosion
- D. Acidic corrosion

14. Cyl liner material

A.Cast iron

B.cast steel

15. As per regulations, the velocity capacity of a steering gear system should be such so as to be able to turn the rudder_____

A. 35 degrees one side to 35 degrees on the other side, in 28 seconds at maximum service speed

B. 35 degrees one side to 30 degrees on the other side in 28 seconds at maximum service speed

C. 35 degrees one side to 35 degrees on the other side, in 28 seconds at normal service speed

D. 35 degrees one side to 30 degrees on the other side, in 28 seconds at normal service speed

16. Governor paralleling for generators requires

A. Fine droop/some droop

B. No droop

C. course droop

17.In diesel generator, increasing the fuel due to drop in load , which will -----save machine from damage

A. Limiting load switch

B. Limiting shredded switch

C. Limiting <<>> sensor

D. Limiting <<>>

18. In 2s, getting normal combustion pr. But reduced in max pr. Due to

A. faulty fuel injection timing

B. exh. valve leaking

C. Piston rings faulty

19. TBN value of cyl oil is too high to sulphur content in fuel oil

A. Alkalinity corrosion

B. Not a problem

20. Efficiency of constant pressure T/C is _____ than pulse type T/K

A. less

B. Equal

C. slightly more

D. Very high

21. Thrust block bearings

A. Tilted <<>>

B. Flat pad

C. Roller

D. Ball bearing

23. Shims are added to the fuel pump

A. retarding injection

B. Advancing injection

25. Use of economizer

A. to reduce exh. Gas temp. so that NO_x will reduce

B.To reduce Sox

C.To increase the efficiency of propulsion unit

26. when A/E stand by F.O.heater in use of main engine

a. Sudden opening F.O. inlet valve pressurized and damage the heater

b. F.O. in vapour lock inside heater allow steam

c. F.O. inlet valve causes pressure drop M/E F.O. pressure standby water is not pressurized may cause sudden change in engine /per load/rpm

d. heater leaking.

SECTION 6

1. Temperature at which hazing of oil is called

i. Haze point

ii. Cloud point

iii. Floc point

2. Operating pressure of which type is greater?

i. Ram type

ii. Rotary vane

iii. Both are almost same

iv. None of them

3. Which steering gear type is electro hydraulic?

- i. Ram type
 - ii. Rotary type
 - iii. Both
 - iv. None
4. Sealing arrangement of T/C of Main engine.
 - i. Compressed air with 30 bar
 - ii. Control air
 - iii. Air directly from compressor of T/C.
5. **when cross head bearing of a large 2 stroke marine engine on a cargo ship is opened up for survey is mandatory for the cross head to be inspected by the**
 - i. port state inspector
 - ii. cargo gear surveyor
 - iii. ISM auditor
 - iv. Attending workshop superintendant
6. The temperature, at which a fuel will start to burn under given conditions, is called its, ignition temperature. This temperature varies greatly with
 - (a) Composition of the air-fuel mixture.

- (b) Amount of excess air.
- (c) Size, shape and temperature of the compression space.
- (d) All the above

7. VESSEL IS AT DRYDOCK , WHO ISSUE HOT WORK PERMIT...???

- I. Options were CE
- II. 2E
- III. shipyard engineer
- IV. Ship superintendant.

8. Following method is sometimes used in constant pressure turbochargers of a 4-stroke diesel alternators during starting and rapid acceleration:

- A. Auxiliary electrical blowers assisting turbochargers during starting
- B. Auxiliary shaft driven blowers assisting turbochargers during starting
- C. Auxiliary air drive for turbocharger acceleration during starting
- D. Variable geometry turbocharging

9. Automatic combustion control systems for some auxiliary boilers are designed to cycle burners on in response to

- I. A. low fuel pressure
- II. B. fuel return pressure
- III. C. low steam pressure
- IV. D. furnace air pressure

10. A normal manometer reading of turbocharger air suction filter and normal speed of

the turbocharger but reduced scavenge air pressure may be due to:

- A. Fouling of the nozzle ring
- B. Fouling of diffuser or compressor wheel
- C. Fouling of the turbine
- D. Cold climate**

11. Abnormal wear occurring in engines due to localized welding and fracture is known as

- A. Scoring
- B. Scuffing**
- C. Peeling
- D. None of the above

12. The bearings used to support the crankshaft are generally called

- A. line shaft bearings
- B. connecting rod bearings
- C. main bearings**
- D. support bearings

13. Which of the following statements is true?

- A. A fuel with high cetane index has longer ignition lag and is associated with better combustion.
- B. A fuel with high cetane index has shorter ignition lag and is associated with better combustion.**

C. A fuel with low cetane index has longer ignition lag and is associated with better combustion.

D. A fuel with low cetane index has shorter ignition lag and is associated with better combustion

14. The flame safeguard control system of a large automatic auxiliary boiler will provide fuel shut off in the case of high

A. water

B. voltage

C. fuel pressure

D. steam pressure

15. What prevents rotation and fretting between a thin shell bearing and its housing ?

A. Location tangs or pegs

B. The nip or crush of the bearing

C. A special kind of adhesive

D. Any of the above

16. Which of the following can be a consequence of worn scraper rings and sealing rings of a piston rod stuffing box?

A. Increased risk of scavenge fire

B. Increased risk of crankcase explosion

C. Increased Lube oil consumption

D. All of the above

17. Which of the following types of crankshafts is much lighter at similar power

requirements?

- A. Fully built type
- B. Semi built, all welded type**
- C. Semi built type
- D. Solid forged type

18. Which of the following types of scavenging systems is most popular in modern engines?

- A. Loop scavenging
- B. Cross flow scavenging
- C. Uniflow scavenging**
- D. Reverse scavenging

19. Steam temperature control for the ESD boiler is achieved by :

- A. Fitting a de-superheater between 1st & 2nd passes of superheater
- B. Fitting an attemperator between 1st & 2nd passes of superheater**
- C. Bypassing the superheater
- D. Gas dampers in boiler uptake

20. Which of the following statements is true?

- A. The TBN value of cylinder oil should be ideally matched with the sulfur content of the fuel.**
- B. The TBN value of cylinder oil is not a function of the sulfur content of fuel oil.
- C. Cylinder oils with higher TBN values should be used for fuel oils with lower sulfur content.

D. The TBN value of cylinder oil is a function of maximum combustion pressure.

21. The super long stroke slow speed 2-stroke diesel engines when compared to short stroke version gives:

A. Poorer propulsive efficiency but better fuel combustion

B. Better propulsive efficiency but poorer fuel combustion

C. Better propulsive efficiency as well as better fuel combustion

D. Poorer propulsive efficiency as well as poorer fuel combustion

22. Coked material remaining after an oil has been exposed to high temperature, is an indication of the coke forming tendency of the oil. It can be expressed as

A. Conradson

B. Ramsbottom

C. Micro Carbon Residue(MCR)

D. Any of the above

23. The purpose of valve spindle rotators in case of exhaust valves of modern two stroke engines is to:

A. Improve engine efficiency by allowing even temperature distribution through the combustion chamber

B. Allow even temperature distribution along the disc of the valve spindle, even wear rate and removal of any deposits

C. Utilising waste energy in the exhaust gases to increase the engine efficiency

D. Allow exhaust gases to exit in a rotational motion, inducing good draught of scavenge air for better mixing of air and fuel for effective combustion

24. In modern 2-stroke marine diesel engines the exhaust valves are:

- A. Mechanically actuated
- B. Pneumatically actuated
- C. Hydraulically actuated**
- D. Electrically actuated

25. Which of the following is a proper practice to follow in the event of discovery of a small soot fire in exhaust gas boilers?

- A. Repeated soot blowing
- B. Stopping cooling water circulation
- C. Reducing main engine speed**
- D. Opening the inspection doors and extinguishing the fire

26. An additive added to a lubricant to keep engine parts clean is known as

-
- A. Dispersant
 - B. Detergent**
 - C. Cleaning agent
 - D. None of the above

27. The scavenge ports of a uniflow scavenged 2-stroke engine cylinder liner are machined at an oblique angle to the axis of the cylinder, why ?

- A. To prevent exhaust gases from coming out of scavenge ports
- B. To allow rotary motion to scavenge air to reduce exhaust gas temperature for reduced NO_x emission

C. To allow rotary motion to scavenge air for better scavenging and better air-fuel mixing

D. To allow rotary motion to scavenge air for better cylinder oil distribution on the liner walls and better turbocharger performance

28. Both power units of a steering gear system need to be switched on _____

A. When the ship is within 12 nautical miles from shore.

B. When pilot is on board

C. When navigational circumstances demand caution

D. ALL

29. The kinetic energy imparted to air by the compressor impeller of a turbocharger is converted into pressure energy at the:

A. Nozzle ring

B. Diffuser ring

C. Inducer ring

D. None of the above

30. Which of the following is one of the disadvantages of cast iron chokes, used in holding down arrangement of engines?

A. Poor compressive strength

B. Poor vibration damping

C. Cast iron is brittle and prone to crack

D. All of the above

31. Economisers are built up with

- A. Copper tubes
- B. Plain steel tubes
- C. Stainless steel tubes
- D. Steel tubes fitted with shrunk on C.I. grills

32. Which of the following is the primary advantage of supercharging the air quantity in a diesel engine, by means of a turbocharger?

- A. It leads to considerable gain in thermal efficiency.
- B. It increases the maximum pressure generated in a cylinder appreciably.
- C. It improves the power to weight ratio of the engine
- D. All of the above.

33. Only a pre determined fixed amount of water should be used during:

- A. Water washing of the turbine side of a turbocharger
- B. Water washing of the blower side of a turbocharger
- C. Water washing of both blower and turbine sides of a turbocharger.
- D. Exhaust gas boiler water washing.

34. A non water-cooled turbocharger offers which of the following advantages?

- A. More heat is available for waste heat boilers
- B. Corrosion problems of internal surfaces due to formation of sulfuric acid are eliminated
- C. Improved thermal efficiency of turbocharger
- D. All of the above.

35. Too high Calculated Carbon Aromaticity index (CCAI) of fuel oil indicates:

- A. Reduced ignition delay
- B. Increased ignition delay**
- C. Reduced chances of knocking
- D. None

36. high tensile steels are

- a) high carbon steels with suitably added alloying elements
- b) medium carbon steels with suitably added alloying elements
- c) low carbon steels with suitably added alloying elements**
- d) none of the above

37. Which of the following is a corrosive type of wear of a cylinder liner?

- A. Scuffing
- B. Scoring
- C. Clover- leafing**
- D. None of the above

38. The common term used for failure of metal and alloys in a corrosive environment , when subject to high stresses is known as :

- A. Fatigue failure
- B. Corrosion fatigue
- C. Stress corrosion cracking**
- D. Fretting corrosion

39. The steels with a carbon percentage close to 0.8% have

- A. poor strength but good weldability
- B. High strength but poor weldability**

- C. Poor strength and poor weldability
- D. High strength and good weldability

40. The maximum pressure a centrifugal pump can generate is called:

- A. Shutoff head**
- B. Total dynamic head
- C. Total head

41. what type of tanks in pressurized gas carrier

- 1.A
- 2.B
- 3.C**
- 4.D

42. The purpose of economiser is to:

- A. Decrease the capacity and size of the auxiliary boiler
- B. Cooling down the exhaust gases in order to reduce NOx emission
- C. Allowing Sox to react at low temperatures with water to form acids thus reducing Sox emission
- D. Increasing the overall efficiency of the main propulsion plant**

43. The fuel pumps used in modern intelligent engines:

- A. Deliver to a common rail**
- B. Are hydraulically operated
- C. Are valve operated

D. Either A or B

44. When fuel is injected late into a diesel engine cylinder,

- a)the exhaust will be clear
- b)fuel consumption will be low
- c)all the fuel will be burned at top dead center
- d)fuel consumption will be high**

45. The direction of flow of cooling water in an engine is always _____.

- A. From top to bottom
- B. From bottom to top**
- C. From left to right
- D. From right to left

46. In Chain drives, chain damage can take place:

- A. Only if the chain is too tight
- B. Only if the chain is too slack**
- C. If the chain is too tight or too slack
- D. None of the above

47. Which of the following is an important factor in hydrodynamic lubrication?

- A. Viscosity of the lubricating oil.
- B. Relative speed between lubricated surfaces.
- C. Bearing clearance
- D. All of the above.**

48. The purpose of downcomers in a water tube boiler is :

- A. To allow the steam to rise to the steam drum

B. To allow cold water to sink to the bottom

C. To protect the fire wall tubes

D. They are one type of generating tubes

49. Which of the following reduce fatigue endurance limit in engine components?

A. Surface flaws

B. Stress raisers like oil holes, change in sections etc

C. Corrosive environment

D. All of the above.

NEW SECTION - 1

1. The pH value of water in a diesel engine closed cooling water system should be maintained between_____

a. 6.0 to 7.5

b. 8.0 to 9.5

c. 10.0 to 11.5

d. 12.0 to 13.5

2. A diesel engine fails to start, even though it can be barred over, but not cranked over. The probable cause is _____.

a. a seized piston

b. an improperly fitted bearing

c. a closed or obstructed air starting line valve

d. insufficient compression

3. At which of the following locations would a duplex pressure gauge most likely be located?

(A) Fuel oil service pump discharge flange

(B) Fuel oil strainer

(C) Fuel oil heater

(D) Fuel oil flow meter

4. Efficient soot blowing of exhaust gas economizers and boilers is essential_____

A. To minimize chances of soot fire

B. To increase efficiency

C. To minimize chances of heavy corrosion and localized heating leading to tube failure

D. All of the above

