

SECTION - 1

1. You have seen and operated several valves onboard ships. All the butterfly valve operation handles are operated by a locking arrangement because:

- A. Butterfly valves do not use gland packings and thus spindle doesn't have anything to keep it in position and can open by vibration
- B. Butterfly valve does have a spindle packing but same cannot be excessively tightened to have good grip on the spindle to prevent it from opening against vibration
- C. Butterfly valves can move by vibration but that is not the main consideration, the main consideration being opening/closing against liquid pressure**
- D. All the butterfly valves do not have locking arrangement as there is no such requirement for the same

2. Which of the group of methods are used for priming of centrifugal pumps onboard ships?

- A. Gravity tank, attached vacuum pump
- B. Attached Vacuum pump, filling pump casing using a fresh water hose
- C. Central priming system, attached vacuum pump, sea water priming**
- D. None of the above

3. Which one of the following is a type of corrosion :-

- A. Electroplating
- B. Galvanisation
- C. Graphitisation**
- D. Demulsification

4. The size of solid particle contaminants in hydraulic systems is measured in:

- A. Millimeter cubed
- B. Nano-millimeter
- C. Microns**
- D. Micro millimeter

5. Pump Start But Motor gets overloaded or Trip on overload.

- A. Alignment is wrong**
- B. Gland packing too tight**
- C. Worn out / Damaged ball bearing**
- D. Cavitations exists
- E. All of the above

Notes:-

Speed too high, Process liquid of higher viscosity, Oversized impeller installed, Total head of system either higher or lower than anticipated, Misalignment between pump and driver, Rotating parts in contact with stationary parts, Worn or damaged bearings, Mechanical seal exerts - excessive pressure on seat, Bent shaft, Pump operating too far out on head-capacity curve.

6. Which of the following instruments measures propeller drop?

- A. Poker Gauge
- B. Telescopic feeler gauge
- C. Trammel
- D. Propeller drop gauge

7. 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

8. Your ship has a OWS and reciprocating bilge pump of capacity 2.0 m³ /hr. It takes about 12 hours to pump out the complete bilge tank through OWS. The ship is going to dry-dock and Chief Engineer is recommending company to install a centrifugal pump of 10 m³ capacity which will take the same space and can pump out the bilge tank only in 2.5 hrs. The company should:

- A. Accept the proposal as a centrifugal pump has several advantages over a reciprocating pump
- B. There is no question of accepting a centrifugal pump as a Engine room bilge pump
- C. Propose to fix a Gear pump instead of a centrifugal pump
- D. Pipelines and pumps once designed cannot be changed as they are class approved

9. Normally so called ???single screw pumps??? are used as sludge pumps in engine room. What is the correct technical name of these pumps?

- A. Snake Pump
- B. Screw Pump
- C. Progressive cavity pump
- D. Gerotor Pump

10. In a Parallel-Gate type valve the sealing between the valve and the disc is provided by:

- A. Appropriate tightening torque of the valve spindle
- B. Gate and valve seat have a taper and when tightened they will seal against each other

- C. Either the seat or the disc Gate are free-floating, allowing upstream pressure to seal the seat and disc against any unwanted leakage
- D. For a gate type valve the sealing is never perfect and they always allow some leakage

11. The crank web deflection readings of a diesel engine would be erroneous in which of the following conditions?

- A. When the draught of the vessel has changed while readings were being taken
- B. When cargo loading and discharging has been too rapid
- C. When the crankcase temperature has changed substantially during the process of taking the readings.
- D. None of the above

12. The purpose of an evaporator in the domestic refrigeration system is to

- A. Transmit latent heat of evaporation
- B. Absorb latent heat of fusion
- C. Absorb latent heat of evaporation
- D. Transmit latent heat of fusion

13. centrifugal pump will typically give you a low flow rate at a lower pressure, where a piston pump will give you more pressure and higher flow rate. Is the statement correct?

- A. TRUE
- B. FALSE
- C. First Sentence is right. Second one is wrong
- D. I Don't know

14. Which of the following is an important requirement for proper functioning of sacrificial anode system :-

- A. Good Insulation between anodes and ship's hull
- B. Good electrical continuity between anodes and ship's hull
- C. Providing protection of anodes from being painted over during hull painting
- D. Presence of an insulating material between anode and the cathode

15. The main disadvantages of a reciprocating pump over a Gear pump is that:

- A. A gear pump is self priming while a reciprocating pump is not
- B. Discharge of a gear pump is not affected by the direction of rotation while that of reciprocating pump is reversed
- C. The discharge of reciprocating pump is pulsating and discharge rate is lesser

- D. Reciprocating pumps are only available in high capacities and for smaller capacities only gear pumps can be used

16. 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, Cloverleafing
- D. None of the above

17. It has been reported that Engine room bilge pump was unable to take suction from Fwd. (P) bilge well while it taking suction efficiently from Fwd.(S) & aft bilge wells. What could be the most probable cause?

- A. There is leakage in the bilge suction pipeline somewhere between the bilge wells and bilge pump
- B. The Fwd. (P) bilge well suction valve might be leaking
- C. The Fwd. (P) bilge well suction filter cover gasket might be leaking
- D. The pump needs to be overhauled

18. You are pumping out sludge to a shore facility using your sludge pump. You find that the discharge rate of pump is very slow and suction filter is getting clogged frequently. What is the best alternative to counteract the problem?

- A. Remove the pump suction filter and pump out the tank
- B. Increase the tank temperature, keep an eye on the pump suction pressure and clean the filter as soon as it drops
- C. As soon as the as the shore facility tells you that they are not receiving any sludge, you stop the pump and clean the filter
- D. Fabricate a bigger mesh size suction filter and use in place of normal filter so that frequency of filter blockage is reduced and you can get a better discharge rate

19. When centrifugal pump is used to pump a liquid of higher specific gravity the pump Power will

- A. increase
- B. decrease
- C. Will not be affected as the pump power depends only on the flow capacity
- D. None of the above

20. The process of depositing zinc on steel surfaces by diffusion coating is known as :

- A. Sherardising
- B. Chromising
- C. Calorising
- D. Galvanising

21. By which of the following is the attached vacuum pump of a ballast pump is driven?

- A. Electrical motor
- B. Hydraulic motor
- C. Pump driven clutch
- D. Pneumatically driven

22. 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

23. A drain cooler is provided with S.W. cooling. What is the best way to increase the temperature of condensate draining to the hotwell?

- A. Throttle the S.W. inlet valve
- B. Throttle the S.W. outlet valve
- C. Open the condensate Bypass to the cooler
- D. Close the condensate bypass to the cooler

24. After cleaning the sea chest filter you have placed the filter in the body and tightened the cover. Which one of the following is the best alternative?

- A. You can open the filter inlet and outlet valves & directly start using the filter
- B. If you do not want to use the sea chest in question, you need not worry and you can open the valves when required
- C. Sea Water inlet valve should be crack opened, the filter body should be purged, any leakages and thereafter filter can be kept isolated or used as required
- D. You will close the other side sea chest valves first and then open this side sea chest filter inlet and outlet valves

25. You must have used reinforced rubber joints. The reinforcement is normally provided using non-asbestos fibres. The reinforcement is provided because

- A. Ordinary rubber gasket have a porous matrix, having capillaries which can allow liquid leakage when subjected to high pressure

- B. To increase the load carrying capacity of joint so it can withstand higher pressures
- C. To increase the temperature resistance of the joint
- D. To protect the joints from fire or other accidental damage

26. Corrosion protection of steel surfaces by zinc coating can be carried out only at temperatures below 65 Deg. C . For higher temperatures :

- A. Zinc reacts very fast and thus can only provide protection for a limited time
- B. Zinc reacts with steel and protective layer vanishes due to chemical reaction
- C. Steel may corrode preferentially to the zinc
- D. Dezincification occurs leading to removal of zinc coating

27. Which of the following valves cannot prevent backflow of liquid in a pipeline?

- A. Gate valve
- B. Globe Check Valve
- C. Swing Check Valve
- D. Angle check valve

28. 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 the seat of the trap
- D. Throttle the steam inlet valve

29. Which of the following option gives you the correct sequence of the metals in decreasing order of preferential corrosion when all of them are bonded and immersed in an electrolyte ?

- A. Titanium, Mild Steel , Zinc , Stainless steel
- B. Titanium , Stainless steel ,Mild Steel ,Zinc
- C. Zinc , Mild Steel , Stainless steel , Titanium
- D. Zinc , Titanium , Mild Steel , Stainless steel

30. Bronze is an alloy typically consisting of :-

- A. Copper , lead & tin
- B. Copper , Zinc & lead
- C. Copper , Zinc & Tin

D. Copper , Tin & Lead

31. In a positive displacement reciprocating pump, the use of the accumulator is to ??????????????.

- A. Steady the flow in the discharge section of the pipe.
- B. Dampen the pressure surge on discharge side.
- C. To always maintain a discharge head on the pump.
- D. Both options A & B**

32. The process of depositing chromium on to steel surfaces by diffusion coating is known as :

- A. Galvanising
- B. Chromising**
- C. Calorising
- D. Coppering

33. When running TWO centrifugal Pumps in parallel, Flow rate"Q" is increased.

- A. TRUE**
- B. False
- C. May Be
- D. I Don't know

34. A refrigerant compressor will run continuously when there is

- A. Too heavy cooling load on the system**
- B. Air in the system
- C. Insufficient refrigerant in the system
- D. Any of the above

35. You have started pumping out a Fore peak tank. The ballast pump is running showing a low discharge pressure but a positive suction pressure,Chief Engineer asks you to throttle the discharge valve to increase the back pressure on the pump. Why do you require to do the same?

- A. The pump's discharge rate needs to be controlled as it is pumping at a higher than rated capacity
- B. Chief Engineer wants you to slow down as the deballasting is going on too fast and will finish sooner than expected
- C. It is a misconception that pumps operate smoothly at increased back pressure and throttling of the discharge valve is a wrong practice

- D. Centrifugal pumps cannot operate at greater than rated capacity, so throttling the discharge valve is only going to decrease the discharge rate below rated capacity

36. You have overhauled a centrifugal pump and while assembling forgot to install the o-ring between the sleeve (provided in way of gland packing) and the shaft. What impact does this have?

- A. It will not affect the pump in any way
B. It will cause leakage of fluid(air/water) in between the shaft and the sleeve and will affect the pump performance
C. It will not affect the pump performance in any way but will corrode the shaft between the o-ring and shaft
D. It will cause dynamic imbalance of the shaft

37. Which of the following types of boiler burners have maximum turn down ratio? (Y-jet, 20:1)

- A. Pressure jet type
B. Spinning cup burner
C. Spill type burner
D. Y-jet type burner

38. Copper tubing is used in Refrigerant system because

- A. It has less internal resistance
B. It is cheaper compared to other materials
C. It is easier to check leaks in copper based system
D. None of the above

39. Which of the following is a true statement ? (choose more than one option if true)

- A. Mild steel will be subject to preferential corrosion when in electrical continuity with stainless steel in presence of an electrolyte
B. Stainless steel will be subject to preferential corrosion when in electrical continuity with Mild steel in presence of an electrolyte
C. Copper will be subject to preferential corrosion when in electrical continuity with Mild steel in presence of an electrolyte
D. Zinc will be subject to preferential corrosion when in electrical continuity with Aluminium in presence of an electrolyte

40. F.O. transfer pump was working efficiently, but it stopped taking suction suddenly. There is a sounding of 6.0 m in the F.O. deep tank. The suction pressure gauge was renewed recently and is showing a positive pressure when pump is running, but Pump is not transferring any F.O. What is the most probable cause?

- A. Pump is damaged and needs overhaul
- B. Suction filter cover gasket might leaking
- C. Pump relief valve might be leaking
- D. The pump suction pipeline is blocked

41. Motor stator winding badly contaminated by dirt, oil and grease should be cleaned by:

- A. High pressure compressed air
- B. Suction or vacuum cleaning
- C. Brushing, spraying or immersion in an approved cleaning solvent
- D. Immersion in fresh water followed by drying

42. Aluminium being lower than zinc in Galvanic series provides lesser protection to steel compared to the zinc coating . Which one of the following is a true statement :

- A. Aluminium coating provides good corrosion protection compared that of zinc at elevated temperatures
- B. Zinc is always preferred over aluminium coating irrespective of the temperature of metal surface
- C. Aluminium is never used as coating material
- D. Aluminium reacts with steel , so cannot be used for coating steel

43. Which of the following statements is False about hydraulic jacks/tensioning tools?

- A. The piston of the jack should be turned back by a certain degree after hand tightening to prevent easy removal after un tightening of the nut.
- B. The piston of the jack should not be turned back after hand tightening during un tightening of the nut
- C. The piston of the jack need not be turned back during tightening of the nut.
- D. The hydraulic pressure need not be relieved during removal of the jack

44. Which of the following can lead to premature failure of roller bearings?

- A. Misalignment
- B. Contamination
- C. Shrinkage
- D. Over greasing

45. Which of the following is NOT a true statement?

- A. Butterfly valves are used for modulating flow and can be throttled
- B. Globe Valves can be straight flow or angle flow type
- C. Swing check valve will provide lesser resistance than same bore diameter globe type check valve
- D. In a globe type valves, mechanical seals are used for providing sealing between the valve bonnet and the spindle

45. When A/E stand by FO heater in use M/E is running the heater fuel inlet v/v open slowly

- a. Sudden open of fuel inlet v/v pressurize and damage heater
- b. Fuel oil inlet v/v vapour lock inside the heater and allow steam
- c. Fuel oil inlet v/v cause drop in M/E fo pressure stand by heater is not pressurized may be leave sudden change in engine load RPM
- d. Heater leaking

46. Impingement corrosion is a

- A. Physical action
- B. CHEMICAL action
- C. Physical and chemical action
- D. None of the above

47. Which of the following is NOT a correct point for sampling of system lube oil for on board or shore analysis?

- A. Standpipes
- B. Purifier outlets
- C. Inlet or outlet of L. O. coolers
- D. Tank drains

48. In which of the following types of refractory failure, softening of the refractory bricks takes place due to presence of sodium/vanadium in fuel?

- A. Spalling
- B. Cracking

C. Shrinkage cracking

D. Slagging

49. A thin layer of electrolyte trapped in a small pits on a metal surface , and remaining stagnant over a period of time , may cause :

- A. Erosion
- B. Bimetallic corrosion
- C. Crevice corrosion
- D. Corrosion fatigue

50. In case of tankers, the speed of cargo pumps is reduced while stripping, why?

- A. To avoid cavitation of the pump as the NPSHa may fall below NPSHr if speed is not reduced
- B. To avoid cavitation of pump as the NPSHa may rise above NPSHr if speed is not reduced
- C. To prevent the pump from over speeding if it loses suction
- D. Decreasing the speed increases the discharge head of the pump which is required to pump out the remaining cargo

51. A ball valve was found leaking in service. Upon inspection it was found that the PTFE seat had worn out and was renewed. The valve stopped leaking in closed condition. How do think a ball valve provides perfect sealing?

- A. The seat fitted is slightly smaller than the outer dimensions of the ball, thus providing interference fit when closed
- B. Either a floating seat is pressed onto trunnion supported ball by liquid pressure or floating ball is pressed onto the seat
- C. Ball is not exactly spherical and is shaped such that during closure the surface coming into contact with seat is of slightly bigger diameter providing sealing
- D. Seat is not exactly spherical, but slightly tapered so that during closure the ball sits tightly on the seat

52. Which of the following statements is False about cleanliness of electric motors?

- A. External motor body cleanliness of totally enclosed is important since the body helps to dissipate heat generated
- B. Dirt, oil, grease and moisture are primary culprits in deterioration of insulation of stator windings of a motor.
- C. High-pressure dry compressed air cleaning is preferred over suction cleaning for stator windings.
- D. Dry compressed air at a high pressure can drive in dirt inside windings instead of removing them.

53. The attached vacuum pump of a ballast pump operates on the principle of a:

- A. Centrifugal pump
- B. Reciprocating pump
- C. Gear Pump
- D. Vane Pump

54. Surface preparation of steel surfaces, prior carrying out painting is important because (choose the best alternative):

- A. Any rust and contaminant inclusions may cause local paint film breakdown
- B. Too much paint will be consumed if surface preparation is not carried out
- C. Surface will be very rough if proper surface preparation is not carried out
- D. Surface preparation deposits a chemical onto steel surface which reacts with paint film and causes

55. Increasing the rotational speed of a cargo pump the pump flow rate will:

- A. Increase in direct proportion to the increase in speed
- B. Decrease in direct proportion to the increase in speed
- C. Flow rate doesn't depend upon speed
- D. Flow

56. After maintaining correct discharge pressure, soon ceases to discharge water what are possible cause?

- A. Pressure gauge wrong
- B. Pump sucking air
- C. Discharge valve throttled
- D. Casing wear ring is worn

57. 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

58. Which of the following valves are designed to have valve seat in pairs - one facing the inlet side and the other facing the outlet side within the valve body?

- A. Butterfly valve
- B. Ball Valve
- C. Globe Valve
- D. Gate Valve

59. In Impressed Current Cathodic protection system , the current for cathodic protection is supplied by :

- A. Use of sacrificial anodes
- B. A low voltage D.C. supply
- C. A low voltage A.C. supply
- D. 110 V A.C. supply

60. Which of the following can lead to short cycling or frequent cutting in and cutting out of a fridge compressor?

- A. Dirty condenser
- B. Air entrapped in refrigerant
- C. High cooling water temperature
- D. Grossly insufficient charge

61. In a Sea Water cooled J.C.W. cooler, the most common cause for loss in cooling efficiency of the heater is:

- A. Scale formation on J.C.W. side
- B. Mud/silt deposits on J.C.W. side
- C. Scale formation on S.W. side

62. Cadmium coatings provide corrosion protection . Cadmium coatings are commercially carried out using which of the following methods :-

- A. Metal Spraying
- B. Electro-plating
- C. Hot-dipping
- D. Metal diffusion

63. The machinery which is usually tested first once the ship reaches a dry dock is

- A. Engine room crane
- B. Engine room lift
- C. Gantry crane for engine room
- D. All of the above

64. A recently completely overhauled Engine room bilge pump was working efficiently. Suddenly one day you find that the pump is not taking suction. You have tried priming with sea water but still the pump doesn't take suction from any of the bilge wells or bilge tank. What could have gone wrong inside the pump? Choose the best alternative.

- A. The bucket rings have worn out
- B. The suction or discharge valve must have worn out and started leaking

- C. The suction or discharge valve might be stuck in one position or some debris might have lodged itself in between the valve and the seat
- D. Pump suction filter might be clogged

65. 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

66. Wheel operated butterfly valves are operated through a reduction gearbox. The Gear arrangement inside of gear box is of _____ type

- A. Bevel Gear
- B. Rack & Pinion Gear
- C. Planetary Gear
- D. Worm & Worm Wheel

67. Cladding is the process used for :-

- A. Protection of metal surfaces against corrosion
- B. Protection of metal surfaces against erosion
- C. Protection of metal surfaces against cavitation erosion
- D. Protection of metal surfaces impingement corrosion

68. Which of the following is a correct point for sampling of system lube oil for on board or shore analysis?

- A. Standpipes
- B. Purifier outlets
- C. Inlet or outlet of L. O. coolers
- D. Tank drains

69. Chromium is a nobler metal when compared to that of steel. In some marine applications Chromium is electroplated to the steel surfaces. Why?

- A. Chromium is a more noble metal so it will not get corroded and thus steel surfaces will remain protected
- B. Chromium plating provides corrosion protection as well as high glossiness and high hardness for better wear resistance and reduced friction to the steel surfaces
- C. Chromium plating is required for providing high glossiness and high hardness for better wear resistance and reduced friction to the steel surfaces and not for corrosion protection

D. Chromium reacts with steel to form an alloy during electroplating which is corrosion resistant

70. Correct method of greasing a centrifugal pump bearing is:

- A. To pump the grease until you feel high back pressure on the Grease pump
- B. To pump the grease for 3-4 pumping strokes of Grease pump for each bearing
- C. To pump the grease when the pump is stopped and drain any old grease at the same time by opening the drain plug, giving only 3-4 pumping strokes on Grease pump for each bearing. the drain plug should then be replaced
- D. **To pump the grease when the pump is running and drain any old grease at the same time by opening the drain plug, until all the old grease is removed and new grease starts coming out of the drain, repeating same for each bearing. the drain plug should then be replaced**

71. Graphitisation is the term used to describe:

- a) Bimetallic corrosion of brass and bronze alloys leading to deposition of graphite
- b) **Selective phase corrosion of grey cast iron leading to corrosion of graphite flakes and leading to loss of strength**
- c) Electroplating process in which graphite is deposited on the mild steel components to protect them against corrosion
- d) Chemical reaction between pure graphite and iron so as to increase the graphite content of iron

72. Accelerated corrosion due to removal of protective surface films (e.g.) oxide layers on metal/alloy surfaces due to turbulence of working fluid is known as

- a) Bimetallic corrosion
- b) **Impingement corrosion**
- c) Cavitation erosion
- d) Selective phase corrosion

73. An auxiliary engine turbo-charged 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.

74. During prolonged astern manoeuvring of the relative expansion between any of the turbine its casing is likely to increase for an alarming level you should (multi choice)

- A) Inform the bridge that no further manoeuvring is possible as the turbine are likely to be damaged
- B) Reduce the vacuum further to control the relative expansion
- C) Keep manoeuvring irrespective of damage to the turbines
- D) Request the bridge to try to reduce number of astern movements

75. Cold and viscous lubricating oil of an auxiliary engine is most likely to cause _____

- A) Sudden stopping of the engine
- B) Difficulty in starting the engine
- C) Rhythmic knocking sound from inside the engine
- D) Drop in RPM of the engine

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

- a) increase temp setting
- b) change setting of viscotherm
- c) do nothing
- d) open steam valve manually more

77. Corrosion of mild steel ca be affectively prevented by

- a. cathodic protection
- b. protective coatings
- c. addition of suitable alloying elements
- d. applying adhesives

78. In a three phase electrical equipment, the immediate action in the event of fuse blowing in one of the phases would be (ref dennis book pg no: 50, if mcq)

- a. to replace with a fuse of correct rating
- b. to replace fuses on all three phases
- c. to try to repair the fuse
- d. to investigate the fault that led to blowing the fuse

79. A butterfly valve was found leaking and has to be overhauled.Which of the following is a correct statement?

- A. There is no need to remove the valve from pipeline and it can be overhauled in place
- B. Butterfly valves cannot be overhauled without removal from pipelines
- C. It is better idea to remove the valve from pipeline and then carry out the maintenance rather than do it in place
- D. It will depends on the time available to you, whether you will remove valve from pipeline or overhaul in place

80. The lower half of main bearing of a very large diesel engine can be removed by:

- A. Pulling out with a chain block
- B. By hammering out with the help of a soft mallet
- C. By slightly jacking the crankshaft and turning out the bearing half with a rope or similar tackle provided.
- D. **By using a special tool in the oil hole and turning the shaft to turn out the lower half.**

81. Which of the following option gives you the correct sequence of the metals/alloys in decreasing order of preferential corrosion when all of them are bonded and immersed in an electrolyte? (mcq)

- A. Stainless Steel , Naval Brass , Aluminium bronze , Copper
- B. AluminiumBronze ,Cupro-Nickel , Monel metal , Titanium
- C. Stainless Steel ,Cupro-Nickel ,Naval Brassl , Monel Metal
- D. **Stainless Steel , Copper, Naval Brass , Aluminium bronze**

82. After cleaning the M/E F.O. heater you have assembled the heater and want to try out the heater before putting into use. Which is the correct sequence of operation of the valves?

- A. **(1) Vent valve open (2) F.O. inlet valve crack open (3) When F.O. starts coming out of vent line close vent (4) F.O. inlet valve full open (5) F.O. outlet valve full open (6) Steam return and inlet valves slowly opened up**
- B. (1) Vent valve open (2) F.O. outlet valve crack open (3) When F.O. starts coming out of vent line close vent (4) F.O. outlet valve full open 5) F.O. inlet valve full open (6) Steam valves slowly return and inlet opened up =ANSWERR
- C. (1) F.O. outlet valve crack open (2) F.O. inlet valve crack open (3) As the pressure gauge shows pressure open steam heating valves slowly (4) Fully open F.O. inlet and outlet valves
- D. (1) Open steam return and inlet valves (2) Open F.O. outlet valve first slowly and F.O. inlet valve thereafter

83. Why is use of Polymer treatment restricted to low-pressure boilers?

- A. It does not effectively control sludge formation.
- B. It does not effectively control scale formation.
- C. **It has no PO₄ present to counter caustic alkalinity**
- D. All of the above

84. During stripping operation the discharge valve is kept throttled to maintain sufficient back pressure, why?

- A. To avoid back flow of sea water into the ballast tank
- B. If back pressure is not sufficient, the ballast water cannot be pumped out as the sea water head on the outside is more
- C. To avoid pump losing suction due to loss of priming as the available suction head is very low
- D. To control the motor current which will otherwise be very high

85. During shutting down the purifier you find that purifier always vibrates heavily for some time and then becomes normal until it finally comes to a stop What should be done to avoid this situation?

- A. The purifier bowl should be cleaned before next startup
- B. The brake should be applied so that the critical speed doesn't last long
- C. Complete overhaul of the purifier should be carried out and the bearings need to be renewed
- D. The bowl should be sent for balancing

85. During shutting down the purifier you find that purifier always vibrates heavily for some time and then becomes normal until it finally comes to a stop. What is wrong with purifier?

- A. The purifier design is faulty
- B. The purifier bowl has a heavy sludge deposit and requires cleaning
- C. The purifier bowl is not balanced properly

D. During shutting down most of the purifiers pass through the critical speed zone

86. SDNR valve is the term used for which of the following type of valves?

- A. Standard Dimension Non-Rusting Valve
- B. Screw Down Non-Return Valve
- C. Small Diameter Negative-Range Valve
- D. Stainless Disc Non-Rusting Valve

87. The suction pressure gauge of the Engine room bilge pump is broken and you don't have a spare. Chief Engineer has asked you to troubleshoot the problem with Bilge pump not taking suction from Fwd.(P) bilge well. You try taking suction from Fwd. (S) & Aft Bilge well and find that pump is taking good suction. Thereafter you try suction from Fwd. (P) bilge well for sometime after priming with Sea Water but there is no change in level. You inspect the suction filter of the pump and find that it is very difficult to remove the same, you had to apply too much of force to lift the filter cover while normally it comes out easily. What does it indicate?

- A. It does not indicate anything, sometimes the filter covers are difficult to remove.
- B. It indicates that the suction valve of the Fwd. Bilge Pump is leaking
- C. It indicates that the suction filter of the Fwd. (P) bilge well is clogged completely
- D. Pump suction filter might be clogged

88. Steel is an alloy of Iron ,carbon and alloying elements . The carbon content of steel is :

- A. Less than 1%
- B. **Less than 2%**
- C. More than 2%
- D. Any percentage of carbon

89. The seating material for perfectly sealing type Ball valves is usually made up of

- A. Rubber
- B. **PTFE or Nylon**
- C. Rubber reinforced with steel wire
- D. Stainless steel

90.The main disadvantage of a centrifugal pump is that:

- A. They are only available in high capacities
- B. They are difficult to maintain
- C. **They are not self priming in nature**
- D. They are extremely expensive pumps

91. The advantage of a reciprocating bilge pump over centrifugal pumps is that:

- A. They do not have any advantage over a centrifugal pump
- B. They have greater capacity to weight ratio
- C. They give a smoother discharge if used in conjunction with an accumulator
- D. **They are self priming in nature**

92. With Reference to the centrifugal pump characteristic curves, what will be the effect when Pump is started a) with Suction valve shut b) with Discharge valve shut

- A. **With Suction valve shut Both Head (H) & Flow rate (Q) will be Zero and with Discharge Valve shut Flow rate (Q) will be Zero & Head (H) will be at Maximum height**
- B. With Suction valve shut Head (H) will be Zero & Flow rate (Q) will be minimum and with Discharge Valve shut Flow rate (Q) will be Zero & Head (H) will at Minimum height.
- C. With Suction valve shut Both Head (H) & Flow rate (Q) will be Zero and with Discharge Valve shut Flow rate (Q) will be Minimum & Head (H) will be at Minimum height
- D. None of the above.
- E. All of the above.

93. If 3 Centrifugal pumps are running in parallel and the backpressure is substantially increased, what effect will be observed on the pumps in use.

- A. **Flow rate will reduce**
- B. Increase in the pump casing temperature.

- C. Safety alarms and trips (high casing Temperature) will activate, if no corrective action taken
- D. None of the above.
- E. All of the above.

94. For shaft sealing of a main sea water pump for ship plying in coastal muddy waters, which is the best option

- A. Gland packing
- B. Lip seal with garter spring
- C. Mechanical seal
- D. Cup seal

95. The best way to clean the compressor impeller of an auxiliary engine turbocharger would be:

- A. By soaking it overnight in a strong chemical solution like carbon remover or air cooler cleaning chemical.
- B. By chipping the dirt off the impeller blades
- C. By using a pneumatic wire brush
- D. By soaking in warm water and then cleaning it gently by rags.

96. Following conditions are given:

#1 cargo tank has cargo A having specific gravity of 0.70, while #2 Cargo tanks has cargo B having specific gravity 1.05

2) #1 cargo pump is taking suction from # 1 Cargo tank, while # 2 Cargo pump is taking suction from # 2 cargo tank and both are pumping ashore to two identical storage tanks ashore

3) # 1 & # 2 Cargo tanks both are identical and both have same sounding during starting; # 1 & # 2 pumps are identical and placed in Pumproom

4) Discharge manifold and shore pipelines for both the cargoes are identical ones and discharge valve for both pumps are fully open. What will be the reading of discharge pressures of both the cargo pumps.

- A. # 1 Pump discharge pressure will be higher than # 2 pump discharge pressure
- B. # 2 Pump discharge pressure will be higher than # 1 pump discharge pressure.
- C. Both pump discharge pressures will be same as both are pumping through identical pipelines to identical tanks ashore
- D. Cannot say anything as discharge pressure will be affected by various other factors

97. Excessive lubrication in compressors can lead to:

- A. Sticking of valves
- B. Carryover and deposit of oil particles in pipelines and reservoirs
- C. Decompression
- D. Detonation

98. Which of the following valve types is available with non-return arrangement?

- A. Gate Valve
- B. Globe Valve
- C. Ball Valve
- D. Butterfly Valve

99. Types of tubes in refer cooler

- A. (a)straight tube
- B. (b) u tube
- C. (c)coil tube
- D. (d)spring tube

100. M/E FO heater steam control v/v send to on viscosity control mode, when u start using FO different viscosity

- A. Change setting viscosity index
- B. Temperature controller
- C. No change in viscosity and viscosity will automatically controlled
- D. We have to change the mode manually

101. Provide in protection against mild steel galvanic corrosion

- a. Copper
- b. Aluminum
- c. Stainless steel
- d. None of the above

102. Less vacuum in centrifugal p/p

- a. Leak of discharge v/v
- b. Loss of gland packing
- c. Loss of fluid in suction tank
- d. Long suction p/p

103. Type of corrosion in fresh water of D/E

- a. Stress
- b. Hot corrosion
- c. Bimetallic corrosion
- d. Selective phase corrosion

SECTION - 2

1. Which of the following V/V cannot be overhauled in place without removing piping?

- A. Ball Valve
- B. Diaphragm valve
- C. Globe valve
- D. Butterfly valve

2. When pressure inside a system falls below that of the vapour pressure of the liquid Cavities r formed, cavities travelling to high pressure region collapses releasing Considerable energy damage the metal surface which is known as

- A) Cavitation
- B) Erosion
- C) Impingement Corrosion
- D) Capitation Erosion

3. Why should only approved toilet cleaning chemicals be used in

- A. Unapproved chemicals can lead to corrosion in the system
- B. unapproved chemicals can lead to toxic conditions in the system leading
- C. To destruction of protective coatings
- D. Unapproved chemicals can kill aerobic bacteria making the plant ineffective Gases produced by use of unapproved chemicals can pose threat to the operators

4. After over hauling reciprocal pump the motor connections were wrongly given.

Determine outcome when pump is started?

- A) The direction of flow wl remain unaffected
- B) the direction of flow wl b reversed
- C) The pump wl get damaged because the suction valve wl block the reverse flow causing overpressure leading to pump breakdown.
- D) The pump wl lose suction N there wl b no flow.

5. For the S.W. side of a M/E L.O. cooler it is noticed that rise in S.W. temperature through the cooler has decreased from 12 deg. C to 7 deg. C over a period of time, while the drop in temperature of L.O. across the cooler has also decreased. All other coolers have been reported to be working normal &

M/E is also running at a constant load in calm weather. What is the inference drawn by decrease in the temperature difference?

- A. The cooling S.W. inlet temperature has reduced
- B. The efficiency of the cooler has increased over a period of time
- C. The cooler has become dirty on the S.W. side or L.O. side
- D. S.W. side of the cooler may be partially blocked with mud and sea shells

6. Centrifugal pumps cannot handle air and require priming. But you are aware that centrifugal which on the same principal can handle air very well. Which two properties of air are responsible because of which the centrifugal pumps cannot handle air:-

- A. Fluidity only
- B. Density only
- C. Both fluidity and density
- D. Compressibility

7. Vacuum priming pumps which work on the principle of fixed vane pumps require _____ for _____ clearance between vane tips and casing.

- A. Lube oil, lubricating
- B. Lube oil, sealing
- C. Water, sealing
- D. Gland packing, sealing

8. Pump driven clutch type attached vacuum pumps are commonly used for priming ballast pumps and emergency fire pumps. What is the factor which clutches the vacuum pump clutch to the pump clutch during start of the pump?

- A. Low suction pressure acting against the spring loaded clutching piston
- B. High suction pressure acting against the spring loaded clutching piston
- C. Low discharge pressure acting against the spring loaded clutching piston
- D. High discharge pressure acting against the spring loaded clutching piston

9. It is given that engine room bilge pump has suction manifold on which 3 valves are located. One valve for the 3 engine room bilge wells suction, another one for Bilge tank suction and the third one is for sea water suction. It is found that the Bilge pump is unable to take suction from any of the bilge wells, but is able to take suction efficiently from Bilge tank. What is the most probable cause?

- A. Pump suction filter cover gasket leaking
- B. Suction filter cover gasket of one of the Bilge wells is leaking
- C. Bilge well suction pipeline leaking between individual bilge well valves and suction manifold valve
- D. Bilge pump suction pipeline leaking between the manifold and the pump

10. WHICH PROCESS IS NOT DONE ON MILD STEEL ..????

- A. hot plating,
- B. electrolysis,
- C. explosion bonding,
- D. metal spraying

11. The ballast valve of the fore peak tank is located in the duct keel and cannot be opened or shut by remote operation. The valves of other tanks can be operated remotely without any trouble. Which of the following will be the best practice?

- A. Valve should be checked locally for troubleshooting without which it is difficult to find the exact problem
- B. The actuator must be defective and should be replaced with a new one
- C. The control circuit is defective and the PCB should be replaced
- D. Shore assistance will be required in such cases

19. It has been reported that Engine room bilge pump was unable to take suction from Fwd. (P) bilge well while it taking suction efficiently from Fwd.(S) & aft bilge wells. What could be the most probable cause?

- A. There is leakage in the bilge suction pipeline somewhere between the bilge wells and bilge pump
- B. The Fwd. (P) bilge well suction valve might be leaking
- C. The Fwd. (P) bilge well suction filter cover gasket might be leaking
- D. The pump needs to be overhauled

20. U R responsible for daily transfers of engine room bilges . U follow the sequences aft –fwd (P)- fwd(s) bilgewel n u hv never experienced a problem but 5/E started the transfer n first transferred forward (s) bilgewel n without any problem n u join him later u find that bilge pump is not taking suction fr f(p) n aft bilgewel n then u hv checked everything is normal. what is the cause.

- A) 5th engineer made a mistake by 1st transferring the fwd (s) bilge wel, normal sequence of operation for engine room machinaries should not b disturbed.
- B) fwd (s) Bilge wel suction valve is leaking
- C) Bilge pump suction filter cover gasket is leaking.
- D) Fwd (s) Bilgewel suction filter cover gasket is leaking.

21. The centrifugal pump r normally

- A) Positive displacement type
- B) Rotodynamic

- C) Screw type
- D) Gear type

22. Sludge pump suction pressure is going full vacuum when u start the pump a taking water of double bottom tank suction u hv checked the suction filter n found in clean condition. Taking suction fr fuel oil sludge tank does not happen. Causes of the problem.

- A) Pump is not working efficiently n reqd. overhauling
- B) F>O> sludge tank suction valve is leaking
- C) W.O. tank D.B. tank suction pipeline has a blockage.
- D) Can ???say what is the problem but definitely the pump needs to b opened up for overhaul

23. The difference between the discharges of a centrifugal pump n reciprocating pump the discharge of centrifugal pump is -----while that if reciprocating is -----

- A) Turbulent, Laminar
- B) Intermittent continuous
- C) Continuous pulsating
- D) Pulaating continuous

24. Which of the foll. is a true statement

A) Aluminum will b subject to preferential corrosion when in electrical continuity with stainless steel in presence of an electrolyte.

b) Stainless steel wl b subject to preferential corrosion when in electrical continuity with mild steel in presence of an electrolyte.

C) Copper wl b subject to preferential corrosion when in electrical continuity with stainless steel in presence of an electrolyte

d) Aluminum wl b subject to preferential corrosion when in electrical continuity with zinc in presence of an electrolyte.

NOTE; The galvanic series determines the nobility f metals and semi-metals. When two metals are submerged in an electrolyte, while electrically connected, the less noble (base) will experience galvanic corrosion. Galvanic series s as follows – Graphite, Au, Ag, Titanium, Ni, Cu, Tin, Pb, Stainless steel, Cast iron, Mild steel, Al, Zn, Mg(least noble). Aluminum will corrode faster than stainless steel

25. Ballast pump injection filter was cleaned n the pump was lined up it was found that there was some leakage in the suction filter suction. The pump started n the leakage started. During de blasting it was found that the pump could not take suction fr one of the double bottoms. The cause could be

- A) Pump was drawing air fr.

B) Pump was drawing air fr suction filter

C) One of the pipe lines on the suction side of the pump might be leaking

D) The filter was not cleaned properly.

26. The most imp. control measure to prevent boiler tube failure is

A) Use of proper refractory mtrl.

B) Proper maintenance of fuel burning equipment

C) Proper maintenance of boiler water condition

D) All of the above

27. When one of the M/E.F.O. heater is not in use then

A) The F.O. inlet n outlet valve should b kept shut, but steam heating valves should b kept crack open so as to keep the heater warm.

B) F.O. inlet n outlet valve should b kept shut n heating valves also should b completely shut n should b drained of any remaining F.O.

c) F.O. inlet n outlet valve should b kept crack open so that the F.O. recirculation can take place.

d) F.O. inlet n outlet valve should b kept shut while outlet valve should be left open so that

28. The gland packing on centrifugal pump shaft should:

A. Not allow any leakage under positive suction pressure

B. Should only allow drop by drop continuous leakage under positive suction pressure

C. Should only allow drop by drop continual leakage under positive suction pressure

D. Should allow considerable leakage as gland packings are meant to allow considerable leakage

29. 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 compressors 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

30. You have a two stage centrifugal pump, with both stages in parallel configuration. After dismantling the pump you realize that you forgot to the marking and both impellers are identical.Both the impellers are single entry type and the eye of both the impellers will come in opposite direction What are you going to do?

A. Since marking was forgotten, so we need not worry, any impeller can come in any place as they are identical

B. Any impeller can come in any place, but the phase sequence of the electrical motor driving the pump may have to be reversed, if impellers have exchanged places

C. You have to find out the right placement of the right impeller with respect to the direction of rotation or by looking at the volute casing

D. Hit an trial method will have to used to find out the correct placement method by assembling the pump and trying it out

31. The de.livery rate of an axial piston hydraulic pump is controlled by varying the position of the _____.

1. Tilting box

2. Slide block

3. Pintle

4. Reaction ring

32. Who gives hotwork permit on drydock

a. C.e.

b. 2.e

c. Supertnt

d. Dock engrs

33. High pressure cut out in ref.system,activated when

A. a.low cooling in condenser

B. b.air in the system

C. c.over charge

D. d.none of the above

34. Ows is observed to be operating in flushing water when u took watch and it suddenly stopped with an alarm when u tried to close bypass valve what will be ur action

a. Do nothing

- b. Inform chief
- c. It is an indication that the OWS is working normally
- d. It is a practice that the OWS is discharged with flushing water throttle

35. The corrosion protection for Cooling Fresh Water systems of Marine Diesel Engines is normally provided by :

- A. Sacrificial anodes
- B. ICCP
- C. Protective Metal coatings of system components
- D. Addition of corrosion inhibitors to the Cooling Fresh water

36. The temperature of the refrigerant is highest just before it enters the _____.

- a. frosting region
- b. evaporator
- c. condenser
- d. gage pressure

37. What does it signify if during your watch you hear a sound of an oil mist detector alarm?

- A. There is leakage of cooling water to the crankcase
- B. There is a dangerous accumulation of gases in the crankcase
- C. It could be a false alarm but needs confirmation

38. Hot corrosion in exhaust valves and fire side of boiler mainly when :

- A. Fuels containing vanadium content with high sodium content are used
- B. Fuels containing vanadium content with low sodium content are used
- C. Fuels containing high vanadium and high sulphur content are used
- D. Fuels containing high sulphur content is used and the exhaust temperatures are uncontrolled and exceed 600 deg. C

39. Why are large centrifugal pumps started with their discharge valves closed?

- A. To ensure proper priming
- B. To limit sudden rise in discharge rate
- C. To limit motor starting current
- D. To minimize starting torque on motor shaft

40. A ballast pump is being used to deballast a fore peak tank which is full. It is seen that suction pressure is positive and discharge pressure is very low compared to rated discharge head. It indicates that:

A. Pump is not operating satisfactorily and pumping capacity is too low

B. Pump is not operating satisfactorily and pumping capacity is higher than rated, throttling of discharge valve is required

C. Pumping capacity is not affected by suction and discharge pressures

D. Pump is operating normally

41. U hv to dismantle a F.O. heater for cleaning . U hv closed both inlet n outlet valves of the heater, both for F.O. n steam side. What wl U do before u start opening the heater?

A) There is nothing more to b done, if u know the valves r holding u can straight away start opening the heater without wasting time.

B) Drain the heater till pressure gauge reads zero n then start opening the heater.

C) Drain the heater till F.O. stops coming out of the drain n then start opening the heater.

E) First open the vent valve n allow the heater to depressurize. N then open the drain valve to drain the contents of the heater.

42. During flooding of dry dock foll. items must b verified?

A) All sea valves are operational

B) All overboard discharge valves r operational

C) Stern tube seal r operational

D) All above

43. Which valve is not quarter turn valve? (globe valve also)

A. Ball

B. Butterfly

C. **Gate**

D. plug

44. while stopping purifier abnormally vibrating, reason:

A. improper bowl seating

B. faulty bearing,

C. un even sludge formation,

D. foundation bolts loosened.

44(1). while stopping purifier abnormally vibrating,reason

- A. 1. improper sludge accumulation
- B. 2. major o/h is been carried out
- C. 3. marking lines are not coincide
- D. 4. bowl bush may not be seated properly

45. butterfly vv stuck in half open position. hw to repair

- A. cant b taken out in open position from line so try to close vv anyhow
- B. apply hammer to shut it
- C. remove pipeline nd do da overhaul
- D. cannot be repaired onboard

46. which of the following option gives u the correct sequence of the metals in increasing order of nobility in galvanic series

- A. stainless steel, ms, cu, zn
- B. cu, ss, ms, zn
- C. ZN, MS, CU, SS
- D. zn, cu, ss, ms

47. Super chlorinating of fresh water tanks in dry dock is done by:

- A. Washing the tanks with 100ppm chlorine solution
- B. Washing the tanks with 50ppm chlorine solution
- C. Leaving a 50ppm chlorine solution in the tank for 4 hours before flushing with clean water
- D. Leaving a 50ppm chlorine solution in the tank for 24 hours before flushing with clean water

48. Which of the following statements about pipe repairs is true?

- A. A very small hole in a pipe does not necessitate permanent repair by way of renewal of section
- B. Welded doublers are acceptable as permanent repairs.
- C. Permanent repairs can only be done by using classification society approved material
- D. None of the above

49. A ballast pump is being used to de ballast a fore peak tank which is full. It is seen that suction pressure is positive and discharge pressure is very low compared to rated discharge head. It indicates that:

- A. Pump is not operating satisfactorily and pumping capacity is too low

B. Pump is not operating satisfactorily and pumping capacity is higher than rated, throttling of discharge valve is required

C. Pumping capacity is not affected by suction and discharge pressures

D. Pump is operating normally

50. A ball valve is found leaking in service and needs to be overhauled. What type of repairs can be carried out?

A. The ball and seat can be lapped together

B. The ball can be machined while the seat can be replaced

C. Normally both the non-metallic seats get worn out and have to be replaced

D. Normally ball gets damaged and has to be replaced

51. In shell and plate type coolers, due to improper flow design or partial blockage of tubes may lead to high turbulence locally. This condition may lead to (choose the best alternatives):

A. Bimetallic corrosion

B. Selective phase corrosion

C. Erosion

D. Impingement corrosion

52. The water from discharge side of the a centrifugal pump is supplied as sealing water to the stuffing box for the pump shaft at:

A. Sealing ring

B. Shaft sleeve

C. Lantern ring

D. Neck bush

53. Process of enrichment of surface of steel and steel alloys by zinc using Electroplating is known as

A. Cathodisation

B. Galvanisation

C. Neutralisation

D. Dezincification

54. Screw pump is generally are ?????????????? pump

A. Slow speed

B. High speed

C. Medium speed

D. All of the above

55. It is given that engine room bilge pump has suction manifold on which 3 valves are located. One valve for the 3 engine room bilge wells suction, another one for Bilge tank suction and the third one will be for _____.

A. Fresh water suction

B. Cargo hold bilge suction

C. Sea water suction

D. Waste Oil tank suction

56. After O'Hauling pumps, pumps cannot be turned freely by hand, the possible cause could be

A. Uneven tightness of the casing Nuts

B. Gasket between the casing too thin

C. Big clearance between the wear Ring

D. Only A

E. A and B

F. A and C

57. If the direction of rotation of a gear pump is reversed due to change in-phase sequence, what happens when the pump is started?

A. Direction of flow remains the same

B. The pump will get damaged due to overpressure on suction side

C. Pump relief valve will be lifted

D. The direction of flow will be reversed

58. resistance testing should be ideally done on electrical equipment when the equipment is:

A. Cold

B. Hot or at working temperature

C. In operation

D. At part load

59. Resistance to corrosion of Aluminium alloys is due to :

A. Aluminium being a very noble metal when compared to other metals in Electrochemical series

B. Formation of Aluminium oxide(Alumina) passive film on surface

C. The rate of corrosion is very low due to very high corrosion potential

D. All of the above.

60. All other conditions remaining constant, when centrifugal pump is changed over for pumping a liquid of higher specific gravity, the discharge head of the pump at the rated capacity will

A. increase

B. decrease

C. Remain same

D. Can't say, depends on other factors too

61. Throttling of suction v/v in screw p/p

A. a.After discharge capacity

B. b.Not after discharge capacity

C. c.Fluid density

D. d.Alter fluid pressure and capacity

62. Cavitation of centrifugal pump

a. $NPSH_r > NPSH_a$

b. $NPSH_a > NPSH_r$

c. Total suction head $< NPSH_r$

d. Total suction head $> NPSH_r$

63. To avoid Cavitation of centrifugal pump

- a. $NPSHr > NPSHa$
- b. $NPSHa > NPSHr$
- c. Total suction head $< NPSHr$
- d. Total suction head $> NPSHr$

64. You have lined up # 1 main fire pump for supply to one of the deck hydrants. You have personally checked opening of all the required valves and start the pump. The pump discharge shows a pressure of about 5 bar, but the deck hydrant doesn't get any water. You line up # 2 fire pump and get water on the deck hydrant when the pump discharge pressure shows only 2.5 bar. State the reason why # 1 Fire pump was unable to send water to the deck hydrant?

- A. The pump discharge pressure gauge was defective
- B. The overboard discharge valve was fully open, the reason why water could not be lifted to the deck hydrant
- C. The pump suction filter might be clogged
- D. The pump discharge valve disc might be stuck on the guide and hence not getting lifted

65. In a shell and type M/E L.O. cooler, the temperature of L.O. is controlled by an automatic temperature control valve. Out at sea with M/E running at sea load it is observed that the temperature control valve opening to the cooler is increasing day by until it becomes 100% open to the cooler. The L.O. outlet temperature _____ after the above condition has reached

- A. Starts decreasing immediately
- B. Starts increasing immediately
- C. Will be maintained at the set point of the temperature controller
- D. Cannot be maintained at the set point and will increase slowly

66. Not preventing cold corrosion in M/E component

- a. Running E.vy at high load
- b. J/W cooling temp. high
- c. High TNB cylinder oil
- d. Cooling charge air in air cooler dew point

67. Freight paid by charterers on a quantity of cargo short-shipped, i.e quantity agreed upon but not loaded by the charterer, is called:

- A. Pro-rata freight
- B. Back Freight
- C. Dead freight
- D. None of the above

68. 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 another as clarifier

SECTION – 3 (DG. SHIPPING)

1. A grease lubricated ball bearing or roller bearing will run cooler if the grease _____.

- (A) fills only 10% of all void spaces within the bearing
- (B) has a high grease penetration number
- (C) is thinned with a suitable lubricating oil
- (D) is heated prior to packing the bearing

2. The gasket and the broken studs have been replaced on a tank manhole cover. Which of the following methods is satisfactory for testing the repair?

- (A) Pressurize the tank with 0.5 kg/cm² air, soap the repaired area, watch for visible signs of leakage or bubbles.
- (B) Fill the tank with water via the ballast pump until the ullage reading corresponds to the maximum depth of the tank.
- (C) Hose test the repaired area with a minimum of 7 kg/cm² water pressure.

Fill the tank via the ballast pump until water flows from the vent line opening on deck.

3. The exposed portion of the outboard propeller shaft is protected against seawater corrosion by _____.

- (A) a heavy lubricant
- (B) a covering of plastic, rubber, or shrunk-on composition sleeve

- (C) a corrosion-resistant paint
- (D) a layer of oxidation formed when the metal of the shaft is exposed to seawater

4. Why are removable sleeves installed on centrifugal pump shafts?

- (A) They make it easier to replace the pump shaft packing.
- (B) They can be economically replaced as they wear out.
- (C) They can be removed when it is necessary to lighten the weight of the pump.
- (D) They increase the strength of the shaft.

5. If a reciprocating air compressor has a knock occurring in frequency with its operating RPM, the cause is probably _____.

- (A) misalignment or worn main bearings
- (B) insufficient cylinder lubrication
- (C) defective or poorly fitted valves
- (D) all of the above

6. Piping is sized by its nominal _____.

- (A) inside diameter regardless of other parameters
- (B) outside diameter regardless of other parameters
- (C) inside diameter from 3mm to 30cm, and over 30cm by its outside diameter
- (D) inside diameter from 3mm to 60cm, and over 60cm by its outside diameter

7. Which of the following problems may be encountered by using an oil having a viscosity higher than that specified for an operating hydraulic system?

- (A) External seal leakage.
- (B) Hunting due to fast response.
- (C) Hydraulic oil film breakdown.
- (D) Increased power consumption .

8. Oil emulsification in engine lubricating oils will tend to _____.

- A. decrease sludge formation in lubricating oil

- B. cause water to separate from the oil
- C. improve the lubricating oil viscosity

D. displace lubricating oil required in areas of friction

9. Lifeboat winches are required to be inspected and an entry made in the logbook. How often is this inspection required to be made?

(A) Every three months

- (B) Every six months
- (C) Every year
- (D) Only after conducting a boat drill

10. If a radial piston hydraulic pump fails to deliver rated fluid volume, the cause can be _____.

- (A) contaminated fluid
- (B) pitted thrust rings
- (C) worn pintle bearings

obstructed suction passage

11. One cause of leaky valves in a low pressure air compressor may be attributed to _____.

- (A) running with an air filter element different from that required by the original manufacturer's specifications
- (B) excessive operating hours without carrying out preventive maintenance**
- (C) the compressor running too fast
- (D) excessive discharge pressure

12. A thermostatic expansion valve is designed to respond to _____.

- (A) refrigerated space temperature
- (B) compressor suction pressure
- (C) vapor discharge pressure in the cooling coils
- (D) superheat at the outlet of the evaporator coil**

10. The color of the refrigeration oil can indicate various operating conditions of the compressor/ refrigeration system in which it is used. Black oil can be an indication of _____.

- (A) copper plating caused by moisture in the system
- (B) bearing wear or piston scoring
- (C) carbonization resulting from air in the system
- D. gasket breakdown

SECTION – 4 JANUARY

1. A _____ type pump is normally used as a Boiler feed pump for Auxiliary Boilerson modern merchant ships

- A. Reciprocating
- B. Heleshaw
- C. Multi-stage centrifugal
- D. Single stage centrifugal

2. Which of the following types of tubes in air compressor coolers would be self-compensating for expansion?

- A. Straight plain tube
- B. U ??? Tube
- C. Coil tube (for multi choice)
- D. Floating tube

3. Which of the following statements is true about compressor air coolers?

- A. Plain tube type coolers have no allowance for expansion
- B. Coil tube type coolers are most easy to clean.
- C. U-tube type coolers are more suitable for lower pressures

D. Floating tube plate on one end allow for expansion in plain tube type coolers

4. Cavitation erosion occurs due to

A. Chemical action

B. Physical action

C. Chemical OR physical action

D. Combination of chemical or physical action

5. The purpose of balancing holes on a single entry closed type impeller of a centrifugal pump

is:

A. To provide static balancing to the impeller

B. To provide dynamic balancing to the impeller

C. To balance out the axial thrust on the impeller & hence on the shaft

D. To reduce weight of the impeller at the same time dynamically balancing the complete rotating assembly

6. You have valves of same bore diameter but of different types. Which of the following is arranged in the decreasing order closing torque required for giving a perfect seal?

A. Globe valve, Ball valve, Butterfly valve(rubber seat)

B. Ball valve, Globe valve, Butterfly valve(rubber seat)

C. Butterfly valve(rubber seat), Globe valve, Ball valve

D. Globe valve, Butterfly valve(rubber seat), Ball Valve

7. Metal cladding provides protection to the metal essentially for the life of ship because

A. During cladding the protective coating reacts chemically with the base metal and inhibits corrosion

B. This is the only method in which the completeness of the metal coating can assured, while other methods are liable to defects

C. The thickness of protective coating is greater compared to any other metal coating method used

D. The adherence of coating is best in case of metal cladding

8. Many diesel engines have pistons with conceive heads to _____.

a. Increase air turbulence and improve fuel mixing

- b. Decrease air turbulence and improve fuel mixing
- c. Prevent fuel after burning when injections ends
- d. Prolong fuel after burning when injection

9. The direction of centrifugal pump depends upon what

a. Vane curvature fr eye to impeller

- b. Vane curvature fr impeller to eye
- c. Direction of volute casing (if mcq)

10. Automatic/manual recirculation valve provided on the seawater overboard are provided.....

- A. S.W. temperature can be regulated and coolers can maintain correct temperatures even with low S.W. temperatures**
- B. S.W. temperature can be regulated and coolers can maintain correct temperatures even with high S.W. temperatures
- C. S.W. can be re-circulated when outside water is extremely muddy
- D. S.W. can be re-circulated to conserve when sea chest suction filters become very dirty

11. Correct sequence of metals in increasing order of nobility in galvanic series:

- A. zinc,mg,al,stel,
- B. mg,zn,stel,al
- C. al, zn, mg, stel
- D. mg , zn, al , stel.**

12. If the suction filter of the ballast pump is blocked during deballastig it will be:

- A. positive suction pressure,
- B. high negavite suction pressure,**
- C. zero suction pressure,
- D. positive suction pressure and positive zero discharge pressure.

13. Three centrifugal pump are running in parallel and back pressure is increased flow ratio will reduce

- A. increase in pump casing temperature,**
- B. safety alarm,**
- C. none,
- D. all.

14. Cylinder head tightening of auxiliary engine should always be done in single stage and as per ??start??

- A. tighten sequence two stage and as per manual advised,
- B. tighten sequence single stage and as per manual advised,
- C. tighten sequence as per manual recommended sequence and stage,
- D. none

15. It is said that strength of steel depends upon carbon percentage, which one of the following steel have max strength

- A. steel with carbon 2%,
- B. steel with carbon 0.8,
- C. steel with carbon 0.32,
- D. pure iron.

16. Which of the following can be provided galvanic protect to stainless steel

- A. copper,
- B. mild steel,
- C. cupro nickel,
- D. titanium.

17. Which series is used for determining the suitable electrode for cathodic protection of metal

- A. Fourier ,
- B. Newton,
- C. galvanic,
- D. none.

18. Moisture in a refrigeration system

- A. faulty in expansion valve,
- B. high suction temperature,
- C. high suction pressure,
- D. low discharge temp.

19. Which of the electrical instruments can be used without interrupting a live electrical circuit

- A. megger test,
- B. continuity tester,
- C. current clamp meter,
- D. none.

20. Aluminum bronze alloy

A , copper, tin, aluminum

B, copper, aluminum, iron

C, copper, nickel, aluminum

D, copper, zinc, aluminum.

21. Screw pump is normally used for

- A. fluid with high viscosity,
- B. better performance at variable temp,
- C. fluid mixed with solids,
- D. all the above.

22. Steel carbon equivalent > 0.5%

- A. good weld ability,
- B. medium weldability,
- C. poor weld ability,
- D. none.

23. In a centrifugal pump the fluid enters

- A. Through eye of impeller
- B. At tip of impeller
- C. Middle of impeller
- D. None of the above

24. Emergency fire pump has been lined up for supplying to fire hydrant on deck. As soon as the pump is started the vacuum pump engages. The suction of the pump goes into high vacuum but the pump discharge pressure remains zero, and the vacuum pump doesn't disengage. What is the most probable cause for the pump not to take suction?

- A. The discharge pressure gauge is defective showing zero discharge pressure
- B. The pump suction filter might be clogged
- C. The suction pressure gauge is defective showing high vacuum
- D. The vacuum pump is defective

25. You have overhauled a centrifugal pump and while assembling forgot to install the o-ring between the sleeve (provided in way of gland packing) and the shaft. What impact does this have?

- A. It will not affect the pump in any way
- B. It will cause leakage of fluid (air/water) in between the shaft and the sleeve and will affect the pump performance
- C. It will not affect the pump performance in any way but will corrode the shaft between the o-ring and shaft
- D. It will cause dynamic imbalance of the shaft

26. Which of the following statements is true?

- A. Corrosion is physical phenomenon while erosion is a chemical phenomenon
- B. Corrosion is a chemical phenomenon while erosion is a physical phenomenon**
- C. Corrosion may be because of chemical or physical action while erosion is due to physical action only
- D. Corrosion is a chemical phenomenon while erosion may be due to chemical or physical action

27. Whenever a F.O. heater is put into use it should first be _____ by using the _____ to prevent _____. Fill in the blanks using the correct set of options

- A. Drained, drain valve, overpressure of heater
- B. Heated, steam inlet valve, blockage of heater
- C. Pressurized, F.O. outlet valve, pressure drop in F.O. line
- D. Purged of air, vent valve, vapour /air lock inside the heater**

28. WHEN BOTH PUMPS OF STEERING GEAR ARE IN OPERATION

- PILOT ON BOARD
- WHEN 12NM AWAY FROM LAND
- FOR NAVIGATIONAL SAFETY
- WHILE MANOUEVRING

29. You have dismantled a centrifugal pump having a double entry impeller, but forgot to do the markings while dismantling. During installation what will you do?

- A. Double entry impellers are identical when seen from both the sides and can be used either way and actually no marking is necessary
- B. Even if the impeller is wrongly placed, the pump can still function if we change the phase sequence of the driving electric motor
- C. Hit and trial method will be used by assembling the pump and trying it out after putting the impeller in one way
- D. Direction of rotation and/or the shape of the volute casing will help you to put the impeller in the correct way**

30. Intercoolers in multistage compressors _____

A. Reduce the work done in successive stages of compression

B. Allow for moisture to be drained between stages

C. Increase volumetric efficiency

D. All of the above

31.i mpingement corrosion can be best avoided during pipeline system design by

A. Keeping flow velocities to a minimum

B. Keeping fluid temperatures low

C. Avoiding conditions leading to cavitation and turbulence

D. Keeping working pressures in the system high

SECTION - 4

1. purifier leaking,bowl opened,cleaned n seal ring changed n put back bt still leaking wat might b wrong

A.high temp

B.high density

C.disc size nt proper

D.Rpm low

2. Your ship is plying in coastal waters in India which is muddy most of the time. Your main sea water pump shaft mechanical seal develops leak every time you are in a port and wears out very fast. What is the cause of the problem(choose the best alternative):

A. The mechanical seals are not of good quality

B. Seal spring pressure is too high and should be adjusted to a lower value

C. Mechanical seals are not designed to work with dirty and abrasive fluids

D. Supply of cooling water to the seal faces is insufficient due to muddy waters

3. Which of the following instruments is used to measure rudder carrier bearing wear down?

- A. Poker gauge
- B. Telescopic feeler gauge
- C. Depth gauge

D. Trammel

4. Which one of the following methods of metal coating provides best protection against corrosion resistance :-

- A. Hot dipping
- B. Metal Spraying
- C. Electroplating**
- D. Metal Cladding

5. brass/bronze/gunmetal composition

- A. 80% Cu, 20% Zn 60%-
- B. copper 39.25% - zinc .75%----
- C. copper 85%. tin5%. lead5%. zink5%

6. Auxiliary engine crank pin bearings are normally renewed:

- A. During every de-carbonization
- B. During every alternate de carbonization
- C. Depending on the condition of the bearings**
- D. After every 10000 hours

7. Which of the following is not a method of cleaning a turbocharger, while it is in operation?

- A. Wet cleaning of turbine side
- B. Dry cleaning of turbine side
- C. Wet cleaning of the blower side
- D. Dry cleaning of the blower side**

8. Noble metals are those which are placed at the

- A. Top of electrochemical series , having high negative corrosion potential
- B. Bottom of electrochemical series , having low negative or positive corrosion potential**

- C. Only those having zero corrosion potential
- D. None of the above

9. During auxiliary engine de-carbonization, which of the following checks need to be carried out?

A. Sounding of all double bottom tanks

B. Connecting rod big end ovality

C. Liner wear

D. Crack detection tests on connecting rod serrations

10. Why is use of Polymer treatment restricted to low-pressure boilers?

A. It does not effectively control sludge formation.

B. It does not effectively control scale formation.

C. It has no PO₄ present to counter caustic alkalinity

D. All of the above

11. Throttling the discharge valve of a centrifugal pump the NPSHr

A. Increases

B. Decreases

C. NPSHr remains constant depending on pump design and only NPSHa changes

D. Both the NPSHr & NPSHa will remain unaffected by throttling of discharge valve

12. In an electrochemical series the metals having higher negative potentials are placed on top, while those with lower negative potentials or positive potentials lie at the bottom. Which one of the following is a true statement?

A. Metals lying high up in the series can provide protection to those lower in the series

B. Metals high up in series can be used as sacrificial anodes for those lying below them

C. Metals lying at the top of series are called as noble metals

D. None of the above

13. After removing all the bonnet securing nuts of a large size globe valve it is found that the bonnet is coming out because of strong adhesion of the gasket between the bonnet and the body. What are you going to do in line with the best practices?(choose the best alternative)

- A. A chain block can be hooked onto the handwheel and bonnet should be (freed out of gasket adhesion) lifted clear of the valve body
- B. Hammer the valve bonnet and the bridge from all sides using a big hammer until the bonnet is free
- C. Use a hammer and chisel and try to force the chisel in, at the joint of bonnet and body equally from all the sides until the bonnet is clear
- D. Try to close the valve disc further onto the seat by turning the handwheel in closing direction so as to ??? jack-up??? the bonnet

14. Double entry impellers have a distinct advantage over single entry impeller. What is it?

- A. They balance out the axial thrust
- B. It gives a higher pumping efficiency
- C. It is cheaper and easier to manufacture
- D. The need of installing line bearing onto the pump shaft is eliminated

15. The steels with a carbon percentage close to 0.8% have

- A. poor strength but good weld ability
- B. High strength but poor weldability
- C. Poor strength and poor weldability
- D. High strength and good weldability

16. Auxiliary engine connecting rod bottom end bolts should be tightened:

- A. Only as per the prescribed torque using a torque range
- B. As per prescribed torque as well as angular measurements as recommended by the manufacturer.
- C. By following previous match marks on bolt heads and connecting rod body
- D. As per prescribed torque and another 10% increase during every subsequent tightening

17. Which of the following statements are true as far as painting of steel hull/structure is concerned?

Multiple choice

- A. Painting can be done under any weather condition
- B. Painting can only be done after proper surface preparation is carried out

C. Painting should only be done on top of appropriate primer coating

D. Several coats of paint can be applied one after the other without any time gap

18. A multistage centrifugal pump is normally used

A. High head

B. High discharge flow

C. High viscous fluids

D. Low viscous fluid

19. A reciprocating pump is used for Engine room bilge service because:

A. Reciprocating pumps are designed for smoother discharge

B. Only small capacity pumping capacity is required, while other pumps are of higher capacity

C. It doesn't churn and mix the bilge water unlike other types of rotary and rotodynamic pumps

D. Shipbuilding industry is still going on old concept, future ships will have centrifugal pumps installed

20. Fire side in boilers gets commonly corroded due to :

A. Galvanic action

B. Formation of Vanadium pentad oxide and sulphuric acid

C. Stress corrosion

D. Crevice corrosion

21. NPSH and the Total suction head are two terms which are commonly used for pumps. Which of the following is a true statement?

A. They are one and the same thing

B. Total suction head is greater than NPSH

C. NPSH is always greater than Total suction head

D. Total suction head and NPSH have no relationship

22. Which of the following can cause exhaust with black smoke in a diesel engine? multi choice

A. Choked air filter of turbocharger

B. Water mixed with fuel

C. Bad atomization of fuel

D. Overload

23. Before putting into operation a coalesce type Oily Water Separator, it is important to:

A. Fill it up with purge water

B. Drain it completely

C. Switch off the heater

D. Keep the three way valve manually open

24. ship is in dry dock, stern tube seal renewal has been carried out, hw will check for the leak

a. fill the system with oil to the maximum level in header tank

b. fill the system with oil to just fill the stern tube

c. fill the aft seal and forward seal tank to the deepest draught

d. refloat the vessel to check for any leaks

25. sea chest is to be cleaned and u found that the filter is stainless steal bucket type filter, inside which there is a zinc anode. The purpose of anode is to..... and should be electrically..... with filter body.

a. Stainless steel filter, isolated

b. mild steel body, continuous

c. protect adjacent pipelines, continuous

d. sea chest, isolated

26. The function of an accumulator on the discharge side of a reciprocating bilge pump is to:

A. Supply liquid even when the pump is not running

B. Dampen out the pressure pulses and smoothen the flow

C. Increase the discharge pressure by storing liquid under pressure

D. No such device is required to be fitted to modern bilge pumps

27. Sequence of metal in the increasing order of nobility in galvanic series

- A) Stainless steel, Mild steel, Copper, Zinc
- B) Copper, Stainless steel, Mild steel, Zinc.
- C) Zinc, Mild steel, Stainless steel, Copper.
- D) Zinc, Copper, Stainless steel, Mild steel.

28. While re-floating the vessel after dry dock, which of the following checks should be carried out?

- A. Sounding of all double bottom tanks
- B. Checking leakages in the stern tube header tanks
- C. Checking leakages at ship side valves
- D. Checking levels of stern tube header tanks

29. Which of the following anodes in an ICCP can be used for comparatively higher current densities :-

- A. Zinc
- B. High silicon Iron
- C. Lead-silver
- D. Platinised Titanium

30. A centrifugal pump may fail to deliver water when first started if the

- A. Water seal pipe is plugged
- B. Pump is not primed
- C. Seal ring is improperly located
- D. All of the above

31, The diameter of the branch suction pipe referred to in item 118 shall not be less than that derived in accordance with the following formula, taken to the nearest 5 mm:

Lowercase d equals 25 millimeters plus 2.16 times the square root of the product of C times the sum of B and uppercase D

where:

d - is the internal diameter of the branch suction pipe, in millimetres

C - is the length of the cargo hold, in metres

B - is the greatest moulded breadth of the ship in metres

D - is the moulded depth of the ship to freeboard deck, in metres
 $d=2.16*\text{sq root}[C(B+D)] +25 \text{ mm}$

32. What to check if Engine is not taking load.?

- a. Water tightness to be checked.
- b. Air to be removed from jacket water outlet line.
- c. Priming lube oil pump to run before starting the engine.
- d. Check the lube oil level.
- e. Check the flow of lube oil.
- f. Blow through the engine before starting.

all d above things shd b checked

33.Which of the following cannot be used as sacrificial anode for the protection of Mild steel structure against corrosion :

- A. Cadmium
- B. Magnesium
- C. Copper**
- D. Aluminium

34. When centrifugal pump is changed over for pumping a liquid of higher specific gravity which of the following is going to change? (mcq option A)

- A. Discharge pressure
- B. Discharge head
- C. Power consumption**
- D. Pump speed

35.In a reciprocating pump the direction of flow depends upon:

- A. Direction of rotation of the pump
- B. Position & fixing of suction and discharge valves**
- C. High pressure to low pressure

D. Whether pump is single acting or double acting

36. Net Positive Suction Head is the

- A. Difference of Total suction head and Total discharge head
- B. Difference of static head and the frictional head
- C. Difference of dynamic suction head and the vapour pressure of liquid

D. Difference of Static suction head and the vapour pressure of liquid

54. what is the best percentage of carbon content in stainless steel which allows welding?

a. 0.35

b. 0.45

c. .55

55. why centrifugal p/p not provided with safety valve while positive displacement p/p is provided?

a. c/f p/p shut down head is 0

b. c/f p/p shut down head is infinity

c. c/f p/p is so designed that it can withstand high pressure.

56. which of the following valves are liable to open/close under the influence of fluid pressure if not in locked position?

a) GATE VALVE

b) GLOBE VALVE

c) PLUG VALVE

d) BUTTERFLY VALVE

57. Frige comp. Running continuously without cutout

- Air in refig.
- Overcharge
- Undercharge
- **Excessive cooling load**

58. Non return v/v of m.s.w p/p is leaking on closed position, You hav a retutn type of v/v onboard of same dimension what will you do.

- **Do northing and run the same p/p order for new one**

- Replace and run the same p/p keeping the other standby until new v/v receives
- Put blank on v/v and run the other p/p

59. Sea suction filter holes corroded and size increased , what can be done

- a. Run without filter no problem to p/p
- b. Order for new till then run with the same filtere
- c. **Do mechanical repair and run the same until new filter comes**
- d. Run the same filter no problem

60. Insulation Resistance testing of 3 phase induction motor is done

- a. Phase to phase
- b. Earth to body
- c. **Phase to earth**
- d. Both a and b

61.Sacrificial anode on sea chest is to protect

- **Stainless steel filter**
- Sea chest
- Pipings

62. In M/E Lo Cooler, Lo Should Pass Through:

a: shell

b: tube

c: either shell or tube

d: none of the above

63: When securing a centrifugal distillate pump, which of the listed steps should be carried out FIRST?

1.Stop the pump.

2.Close the pressure gage valves.

3.Trip the three-way solenoid valve.

4.Close the sealing line valves to the pump.

Dezincification is the term used to describe

- A. Loss of zinc an alloy due to formation of internal bimetallic cells due to different alloying elements
- B. Loss of zinc due to external bimetallic cells between zinc alloy and another dissimilar metal or alloy
- C. Removal of zinc from an alloy by precipitation from Eutectic solution

D. Removal of zinc from an alloy by dissolving the alloy in a zinc dissolving chemical

Fixed vane type emergency fire pump priming vacuum pump. After one week fire pump not taking suction. The vacuum pump is engaging , but not developing vacuum in the suction side. What will be the cause?

- a. Suction filter of the pump clogged
- b. Suction filter cover gasket leaks
- c. Vacuum pump not overhauled properly

d. Sealing water tank is empty

3.What is the purpose of the Bypass valve (Automatic or Manual operated) on the positive displacement pump?

A. Control the Discharge Pressure

- B. Another valve provided for Discharging
- C. Not required
- D. I don't know

4.When specified Discharge pressure is not achieved, The Possible cause could be?

A. Discharge pressure too high

B. Pump speed too low

C. Casing ring is worn out

D. Cavitations exists

E. All of the above

5. When steel components electroplated with chromium are used in a corrosive Environment then

A. Chromium plating provides corrosion protection to the steel components

B. Chromium plating cannot provide corrosion protection as steel will be preferentially corroded

C. Zinc plating is to be used on top of chromium plating for corrosion protection

D. Thickness of chromium plating is required to be increased for corrosion protection

7. The amount of current needed for hull protection in case of ICCP system for a particular ship will be most effected by :-

A. Wetted surface area

B. Quality and condition of protective paint coating

C. Speed of the ship

D. Sea water temperature

Polymer treatment is restricted only to low pressure boilers because

A. It cannot prevent sludge formation

B. It cannot prevent scale formation

C. It cannot prevent PO_4 formation

D. All the above

A submerged type centrifugal pump is sometimes used as the Main L.O. pump. Why is this?

A. Flow rate required for Main L.O. systems are very high

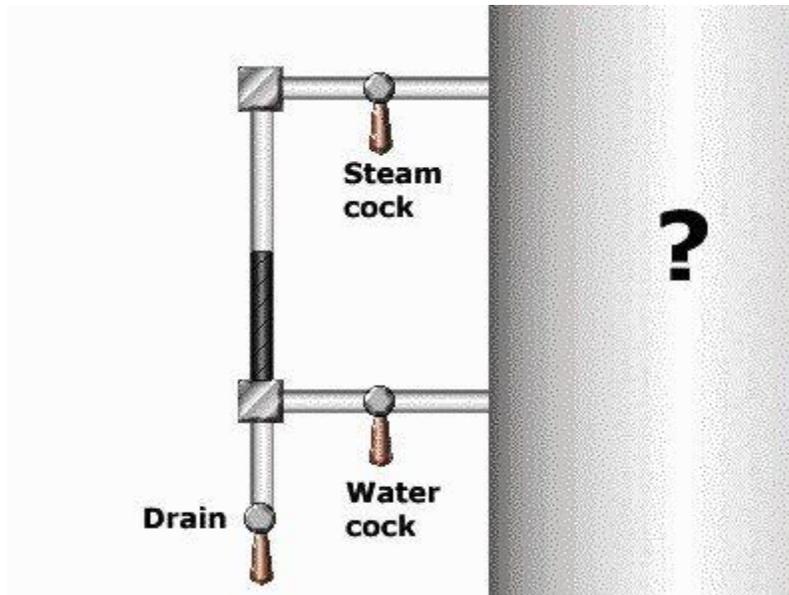
B. The pressure required for Main L.O. system is high

C. It is a wrong design and such systems normally give problem

D. Both the pumps can be run together when the bearing temperatures are increasing

After closing the drain during the blowing procedure for a glass water gauge, the water cock is opened and the water flows to the top of the glass. Then the steam cock is opened and the water flows down and out of the glass; Which of the following statements are correct?

- a) The water level in the boiler is below the water cock connection of the boiler. It is unsafe to put feed water into the boiler.
- b) The water level is above the steam cock connection of the boiler. There is a danger of priming the boiler if any additional feed is put into it.
- c) The water level is normal, but it requires time for the gauge glass to stabilise. It is safe to put feed water into the boiler.
- d) The water level is between the water cock connection of the boiler, and the bottom of the gauge glass. It is safe to put feed water into the boiler.



FEB 2013

Wet corrosion in the process which is

Electrolytic in nature

Reaction between metal and their environment at the near amp temp

Both a and b are not wet corrosion

Both a and b are wet corrosion

Centrifugal pump do not have relief valve why.

Shut of head of centrifugal pump is limited and the system design to handle the same

Shut of head is zero

Shut of head of positive displacement pump is limited and centrifugal pump are infinite

Centrifugal pump are with high pressure trip switch for over pressure of the pump

Mechanical seal renew of a pump, the matting face of a seal .

Lap against each other

Lap on the surface plate

All

causes of drop in efficiency in fo heater

a scale deposit on steam side

b siudge eposit on steam side

c high visosity of fo in use

d m\e consumption higher than normal due to rough weather

centrifugal pump liquid filled inside casing pirior sstarting why

a pumping

b priming

c cavatation

regulation

which one is not self actuated valve

a ball valve

bcheck vale

c pressure relief valve

d saftey valve

Lantern ring in centrifugal pump is located

A. Around the impeller

B. Between gland packing

C. Around submerged bearing

D. Around the casing ring

Submerged pumps are sometimes used as main lo pumps.

- A. High flow rate reqd for me lubrictn
- B. High pressure reqd
- C. If bearing temp rises we can run two pumps parallel
- N one more option

During dry dock which of the following should be kept running

- A. Air conditioning plant
- B. Refrigeration plant
- C. Sewage plant
- D. All of the above**

Boiler corrosion is prevented above 100 deg by formation of a protective layer inside of

- A. Ferrous hydroxide
- B. Magnetite**
- C. Haematite

N one more option

(magnetite Because of its stability at high temperatures, it is used for coating industrial watertube steam boilers. The magnetite layer is formed after a chemical treatment (e.g. by using hydrazine, ferrous hydroxide is firstly formed but under anaerobic conditions transformed into magnetite which is mre stable...)

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

After overhauling a centrifugal pump you have found that the motor electrical connection was wrongly done and pump is rotating in opposite direction. Determine the outcome when the pump is started.

- A. Pump will function as normal
- B. The discharge pressure of the pump will show an increase above the normal
- C. The flow direction will be reversed
- D. Both the pump discharge head and the capacity will be affected (ans)

Cold corrosion in exhaust side of marine diesel engines and fire/smoke side of Boilers occurs mainly due to :

- A. High vanadium content of fuel oil
- B. High sodium content of fuel oil
- C. High sulphur content of fuel oil (ans)
- D. High catfines content of fuel oil

You have to open up a F.O. heater for cleaning. As 2nd engineer has reported that the valves of F.O. inlet is not holding, the M/E was changed over to D.O. during arrival port and the F.O. system was shut down after arrival port. You have been instructed to open up the heater. What will you do?

- A. Start opening up the heater right away as anyway isolation valves are leaking, but the system is shut down
- B. Isolate the valves as required and allow the heater to depressurize and drain completely prior opening (ans)
- C. Depressurization of heater may be carried out if required and then it can be opened up
- D. The job cannot be done and needs to be done in dry-dock

In aerobic sewage treatment units, it is paramount that the air blower runs at all times. Which of the following would constitute an ideal alarm for failure of belt driven blowers?

- A. Motor failure alarm
- B. Low air pressure alarm on blower outlet.(ans)
- C. Low suction pressure on blower inlet
- D. None of the above

Combined action of corrosive environment and cyclic stresses may lead to metal or alloy failure . The failure mode is known as :

- A. Stress corrosion
- B. Fretting corrosion
- C. Fatigue

D. Corrosion fatigue (ans)

Phosphor bronze is an alloy consisting of

A. Copper , Tin & Phosphorous (ans)

- B. Copper , Zinc & Phosphorous
- C. Copper , Lead & Phosphorous
- D. Copper , Cadmium , Nickel & Phosphorous

Auxiliary engine connecting rod bolts should be renewed:

A. After every 20000 hours even if they are in apparent good condition

B. After manufacturer recommended running hours even if they are in apparent good condition (ans)

- C. At every de carbonization
- D. Only when surface flaws or elongation is observed.

Which of the following statements best describes the process of corrosion?

A. Corrosion is a physical/mechanical process

B. Corrosion is a pure chemical process (ans)

- C. Corrosion is a chemical process but many types of corrossions are effected or enhanced by physical processes
- D. Corrosion may be due to chemical activity or physical activity

For a globe valve in operation it is seen that the gland packing is leaking when the valve is kept in throttled position. Tightening of the gland packings doesn't help much. Second Engineer decides to keep the valve fully open and it is seen that the Gland packing leakage suddenly stops!! The most probable reason why the leakage stopped is (choose best & most logical alternative):

A. Valve spindle was badly scored in way of gland packings while throttled, while movement of the valve spindle caused smooth portion of valve spindle to come in way of packing thus stopping leakage

B. Valve spindle was bent and eccentricity of spindle in way of gland packing decreased while valve was opened completely thus providing better sealing in full open position

C. Almost all the Globe valves are designed with a back seat and spindle seats itself on the back seat when fully open, thus gland packing stopped leaking

D. Leakage sometimes just stops by chance as you move the spindle and it has nothing to do with any of the above options

The Non-return discharge valve of one of the Main Sea water pumps was found badly leaking in closed position. Upon inspection it was found damaged beyond repair. You have a new valve of same specification except that it is a return type valve. Which of the following is the correct practice?

A. You can use the new valve and there will be no problem during service

B. There is no use putting the new valve and you can put the same old valve until a new one arrives

C. If using the new return type valve you have to make sure that you keep this Sea Water pump running while the other as stand by while out at sea. In the meantime order and procure a new valve

D. Put a blank in the Main sea water pump discharge line and sail only using one Sea water pump until and new valve arrives

Deballasting of Fore peak tank, which was full, was commenced. The suction pressure was positive until the sounding was 2.0 m and the gland packing was found leaking. Below 2.0m sounding the suction went into slight vacuum and the leakage of gland stopped. Deballasting was normal until the tank sounding was 150 cm when the pump lost suction & the suction pressure gauge first started fluctuating and the suddenly started showing positive pressure. The most probable cause leading to pump losing suction could be:

A. Tank already empty, while sounding being faulty

B. Leaking suction filter

C. Leaking gland packing

D. Suction pressure doesn't give correct indication and discharge pressure gauge should be checked to know whether the pump is taking suction or not

<![endif][if gte mso 9]><![endif][if gte mso 9]><![endif][if gte mso 10]> <![endif]--> What will happen to the motor current if the discharge valve of a centrifugal pump is completely shut off? The current will

A. Not change

B. Increase to a very high value (ans)

C. Increase slightly

D. Decrease to no-load value

Older tankers were designed to carry clean ballast in cargo tanks(CBT). Assume that Ballast Water and the crude oil have same density.While pumping out crude oil the motor of the cargo pump for CBT will draw _____ current compared to when pumping Ballast given that the same discharge pressure is maintained in both the cases.

A. More

B. Less

C. Same (ans)

D. Motor current doesn't depend on the type of liquid being pumped but depends on the pump design

Ballast pumps have individual suction filters provided. Onboard your ship it is seen that during ballasting the ballast pump suction is getting blocked very frequently during ballasting. You should:

A. Remove the suction filter because there is already sea suction filter to protect the pump

B. Clean the suction filters as frequently as required, but also open and inspect the sea chest filters (ans)

C. Stop using the pump and keep filling the tanks by gravity

D. Suspend the ballasting operation

The cooling S.W. temperature rise through the condenser of Fresh water generator has increased. What does it indicate?

A. Fresh water generator is production capacity has increased

B. Fresh water generator is production capacity has decreased

C. It does not indicate anything because temperatures may rise and fall while the Fresh water generator is running

D. Nothing can be said as various factors are responsible

Corrosion resistance of stainless steel in presence of O₂ in aerated water?

a) O₂ inhibits chemical rxn

b) O₂ combines with stainlesssteel to form passive oxide film

c) O₂ get absorbed into stainlesssteel

note: The stainless steels used in water circuits are generally either austenitic or ferritic grades. The stainless steels show perfect corrosion resistance, thanks to their passive layer. Their corrosion resistance does not depend on the formation of a protective layer of corrosion products, but on the existence, over the whole of their surface, of a suitable passive layer. In all strictness, they should be described as self-passivating steels. If the metal surface is clean, the passive layer forms spontaneously in all waters complying with the EC Directive 98/83.

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Which of the following valves are not designed normally for bi-directional flow(return type or two-way flow valve)?

- A. Gate valves
- B. Globe valves
- C. Butterfly Valves
- D. Ball Valves

During cleaning of the sea water suction filter, it was found that at some places the mesh size has increased either due to corrosion or due to mechanical Damage. What action is required?

- A. No action is required, it is quite normal for sea water filters to get corroded and it will not effect the pump in anyway
- B. Keep the pump which is having corroded filter on standby use while keep using the other pump. Meanwhile order for the new filter
- C. The pump can be run without filter for a short time, while the filter is being repaired
- D. Permanent repairs to the filters should be carried out before putting it into service, or it should be replaced with good spare filter

Which of the following metals can be used as sacrificial anode for protection of Mild Steel

- A. Aluminium
- B. Zinc

- C. Cadmium
- D. All of the above.

Corrosion resistance of Stainless Steel is more in presence of Oxygen or aerated water because :-

- A. Oxygen inhibits the chemical reaction to take place between the stainless steel and other metals
- B. Oxygen combines with stainless steel to form a passive oxide film on the surface which increases resistance to corrosion
- C. Presence of oxygen in fact increases the rate of corrosion and stainless steel will get corroded at a much faster rate
- D. Oxygen gets adsorbed onto stainless steel surface rendering it passive

Turbocharger turbine side water washing of auxiliary engine turbochargers is normally done

- A. At part load
- B. At near full load
- C. At idle running
- D. None of the above

In shell and plate type coolers, due to improper flow design or partial blockage of tubes may lead to high turbulence locally. This condition may lead to (choose the best alternatives):

- A. Bimetallic corrosion
- B. Selective phase corrosion
- C. Erosion
- D. Impingement corrosion

In reverse osmosis type freshwater generator plants, pretreatment of the feed water is done to:

- A. Soften the feed water
- B. Sterilize the feed water
- C. To facilitate wash through of salt deposits on elements
- D. Add necessary minerals to the water.

On positive displacement pumps a relief valve is normally required, but in case of centrifugal pumps no such relieving arrangement is fitted. Why?

- A. The shut off head of a centrifugal pump is limited and system is designed to handle the same
- B. The shut off head of a centrifugal pump is zero
- C. The shut off head of a positive displacement pump is limited while that of a centrifugal pump is infinite
- D. Centrifugal pumps are provided with high pressure trip switches in case the pressure exceeds