



**D. MARINE**  
Study Material

# **MEO CLASS 4**

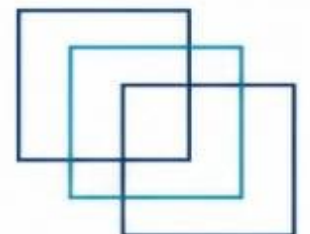
# **WRITTEN: MEP**

**(MARINE ENGINEERING PRACTICE)**

**FOR INDIAN COMPETENCY EXAM**

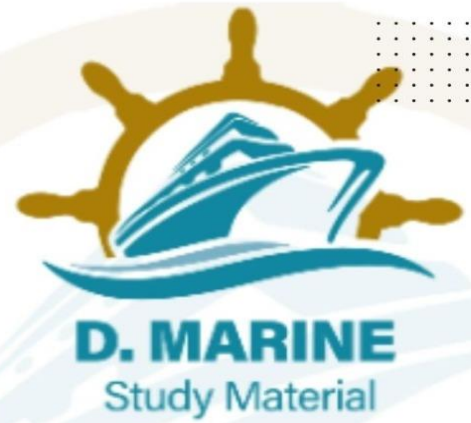


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## JANUARY - 2025

Q1. (a) Explain the circumstances under which a two stroke engine fails to turn on air. (8)

(b) What investigations and corrective actions are required to be taken by you as a watch keeping engineer if the engine does not turn on air after repeated trials?

**2025/JAN1/Q1**

[Click Here to See the Answer](#)

Q2. Prepare a report to the Chief Engineer stating how an emergency fire pump which had difficulty taking suction earlier during ballast passage of a ship, is now rectified to operate satisfactorily under any acceptable condition of loading of the ship. (16)

**2025/JAN1/Q2**

[Click Here to See the Answer](#)

Q3. Explain in detail how you would isolate one section of a water sprinkler system for routine maintenance. Describe all tests and inspections you would make and how you would return the system to service. (16)

**2023/SEP/Q5** **2023/OCT/Q5** **2024/FEB/Q3** **2025/JAN1/Q3**

[Click Here to See the Answer](#)

Q4. Describe a procedure for cylinder liner calibration indicating how the readings are recorded to allow for easy recognition of liner wear. (16)

**2024/FEB/Q4** **2025/JAN1/Q4**

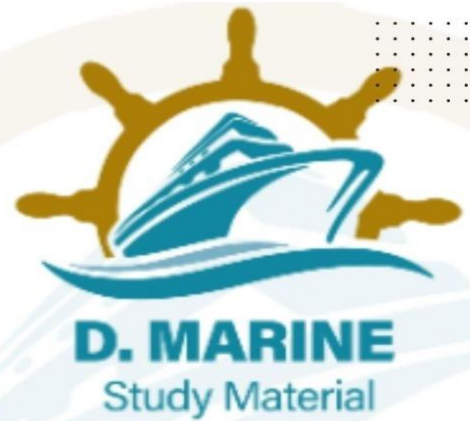
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Q5. (a) State, with reasons, the causes of fatigue cracking of engineering components. (4)

(b) State, with reasons, how material and design defects can influence fatigue life. (6)



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(c) With reference to engine bed plate transverse girders explain how the incidence of fatigue cracking can be minimized. (6)

**2023/SEP/Q8** **2023/OCT/Q8** **2024/FEB/Q5** **2025/JAN1/Q5**

[Click Here to See the Answer](#)

Q6. (a) Describe different components used in soldering process. (6)

(b) Describe soldering process in detail. (6)

(c) What are Do's and Don'ts for good soldering joint. (4)

**2023/JUL/Q2** **2024/FEB/Q6** **2025/JAN1/Q6**

[Click Here to See the Answer](#)

Q7. Write short notes on the following:

(a) The need for taking double bottom tank soundings regularly after a grounding incident. (4)

(b) Need to pre-heat main engines prior to continuous running of the engine. (4)

(c) Utility of pressure gauges on either side of high pressure fuel oil filters. (4)

(d) The purpose of opening indicator cocks before blowing through an engine. (4)

**2025/JAN1/Q7**

[Click Here to See the Answer](#)

Q8. (a) Describe maintenance required on auxiliary boiler burner. (8)

(b) Describe safety features provided on fuel burning system of auxiliary boiler (8)

**2023/MAY1/Q9** **2023/JUL/Q9** **2024/FEB/Q8** **2025/JAN1/Q8**

[Click Here to See the Answer](#)

Q9. (a) Describe what would be the indications of crank case explosion in main engine. (4)

(b) Describe actions to be taken, if there is crank case explosion in main engine. (8)

(c) Describe means of prevention of crank case explosion. (4)

**2023/JUN/Q2** **2024/FEB/Q9** **2025/JAN1/Q9**

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## FEBRUARY - 2025

**Q1.** (a) State FOUR reasons for persistent slackening of holding down bolts of a main engine. (6)

(b) State FOUR precautions to be observed when fitting non-metallic chocks in order to ensure accurate choking. (4)

(c) State the periodic checks to be made in order to assess the effectiveness of an engine chocking system. (6)

**2024/MAY1/Q1** **2024/SEP1/Q1** **2025/FEB/Q1**

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**Q2.** A biological sewage system develops a fault, which necessitates opening the unit for repair.

(a) The risk associated with opening the unit. (6)

(b) The precaution taken to reduce the risk. (6)

(c) Explain the significance of biological oxygen demand (B.O.D.). (4)

**2023/AUG/Q5** **2024/MAY1/Q2** **2024/SEP1/Q2** **2025/FEB/Q2**

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**Q3.** Work is being carried out in drydock on a large sea water inlet chest and the valves. Describe the inspection you would carry out:

(a) As the work starts (8)

(b) During and after the work. (8)

**2023/APR/Q6** **2024/MAY1/Q3** **2024/SEP1/Q3** **2025/FEB/Q3**

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**Q4.** (a) How are heat exchangers protected from the effects of corrosion?

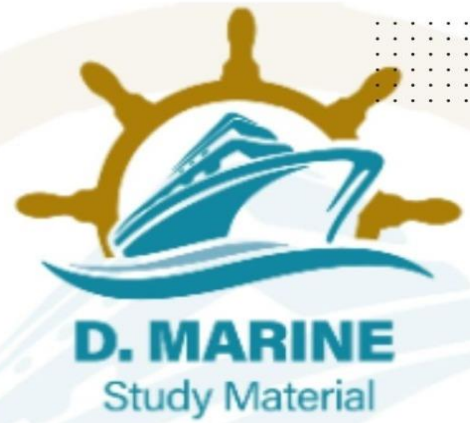
(b) What are the problems associated with biofouling? (8)

**2024/MAY1/Q4** **2024/SEP1/Q4** **2025/FEB/Q4**

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Q5. Describe the procedure for the regular maintenance routines to be carried out on the Fixed CO2 fire-fighting system. (16)

**2024/MAY1/Q5** **2024/SEP1/Q5** **2025/FEB/Q5**

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Q6. A jacket cooling water, plate type cooler for the engine system is stripped open during overhaul for survey purposes, State out a list of components, parts or areas, which you would like to particularly check yourself before the survey. (16)

**2024/MAY1/Q6** **2024/SEP1/Q6** **2025/FEB/Q6**

[Click Here to See the Answer](#)

Q7. During the watch main engine crank case mist detector alarm has sounded.

(a) List the steps to be taken to meet this emergency situation. (8)

(b) Subsequent inspection and action required to put the engine on normal operation (8)

**2022/SEP/Q8** **2024/MAY1/Q7** **2024/SEP1/Q7** **2025/FEB/Q7**

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Q8. With reference to starting air receivers:

(a) Explain why starting air receivers should be drained frequently. (6)

(b) Describe the procedure for the inspection of the internal surfaces of an receiver, indicating the possible defects, which may be encountered. (10)

**2024/MAY1/Q8** **2024/SEP1/Q8** **2025/FEB/Q8**

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Q9. During recent periods of manoeuvring, a number of air start valve bursting discs or cones have failed. In the circumstance, indicate how the actual cause might be:

(a) Detected (8)

(b) Rectified (8)

**2024/MAY1/Q9** **2024/SEP1/Q9** **2025/FEB/Q9**

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## MARCH - 2025

Q1. (a) Describe the procedure for:

(i) Riveting work (5)

(ii) Removing a stud from the plates. (5)

(b) What are the essential tools required for the procedure in (a) above. (6)

**2025/MAR/Q1**

[Click Here to See the Answer](#)

Q2. (a) Describe how cylinder liners are checked for wear (5)

(b) Explain how these measurements are recorded (5)

(c) Explain why allowance for wear is limited and what extent of the wear governs liner replacement (6)

**2024/MAY2/Q2** **2024/AUG/Q2** **2025/MAR/Q2**

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Q3. (a) Describe uses of compressed air onboard the ship. (6)

(b) Describe maintenance schedule of various systems on main air compressor. (6)

(c) Describe Isolation procedure of main air compressor before starting any work (4)

**2023/APR/Q4** **2025/MAR/Q3**

[Click Here to See the Answer](#)

Q4. (a) Describe why priming is required for a centrifugal pump. With the aid of a sketch, describe working of a primer for centrifugal pump. (10)

(b) Why balance holes are provided in the impeller? (6)

**2022/NOV/Q2** **2023/APR/Q5** **2025/MAR/Q4**

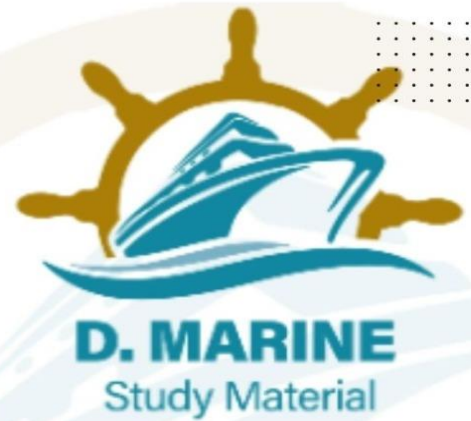
[Click Here to See the Answer](#)

Q5. Work is being carried out in drydock on a large sea water inlet chest and the valves. Describe the inspection you would carry out:

(a) As the work starts (8)



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(b) During and after the work. (8)

**2023/APR/Q6** **2024/MAY1/Q3** **2024/SEP1/Q3** **2025/FEB/Q3**  
**2025/MAR/Q5**

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Q6.a) Describe how A. E, crankshaft deflections are measured. (6)

b) State how the measurements can be checked for accuracy. (5)

c) Specify with reasons other checks that should be made on the crankshaft.

**2022/SEP/Q5** **2022/OCT/Q6** **2022/DEC/Q9** **2023/APR/Q7** **2023/SEP/Q9**  
**2023/OCT/Q9** **2024/JAN/Q7** **2024/JUN/Q7** **2024/NOV/Q7**  
**2025/MAR/Q6**

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Q7. With reference to auxiliary boiler safety valves state with reasons:

(a) What clearances need checking when lapping valves to seats (5)

(b) Why the drain must be clear (5)

(c) Why opening gear should be kept in good working order at all times (6)

**2024/MAY2/Q7** **2024/AUG/Q7** **2025/MAR/Q7**

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Q8. Describe the procedure for the regular maintenance routines to be carried out on the various types of portable fire extinguisher on ships. (16)

**2023/APR/Q8** **2025/MAR/Q8**

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Q9. With reference to exhaust valves of an auxiliary diesel engine.

(a) Describe how valves are reconditioned (8)

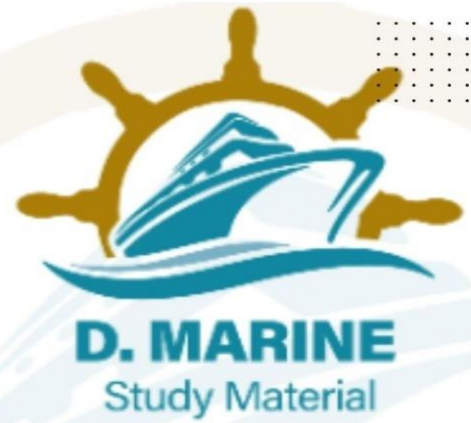
(b) Explain how valve timing is checked and corrected. (8)

**2023/APR/Q9** **2025/MAR/Q9**

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## APRIL- 2025 (PART-1)

Q1. (a) Describe how leak in a Heat exchanger tube is detected? How to rectify leaky tube? (8)

(b) What are the common methods to enhance heat transfer of heat exchanger? (4)

(c) Describe reasons for poor performance of heat exchanger and actions to rectify the same. (4)

**2024/MAR/Q1** **2024/DEC1/Q1** **2025/APR1/Q1**

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Q2. Describe the Stern Tube Lubrication System by drawing a schematic diagram and explaining function of each component. (16)

**2024/JAN/Q2** **2024/DEC1/Q2** **2025/APR1/Q2**

[Click Here to See the Answer](#)

Q3. With respect to the properties of fuel oil, explain the significance of the following terms.

(a) Calculated Carbon Aromaticity Index (CCAI). (4)

(b) The importance of Sodium to Vanadium Ratio. (4)

(c) Sulphur content. (4)

(d) Pour point. (4)

**2024/DEC1/Q3** **2025/APR1/Q3**

[Click Here to See the Answer](#)

Q4. (a) What causes cavitation in a Centrifugal pump operation? (6)

(b) If the Engine room Bilge pump not taking suction, explore the probable reasons? (6)

(c) Why is a centrifugal pump started with its discharge valve shut? (4)

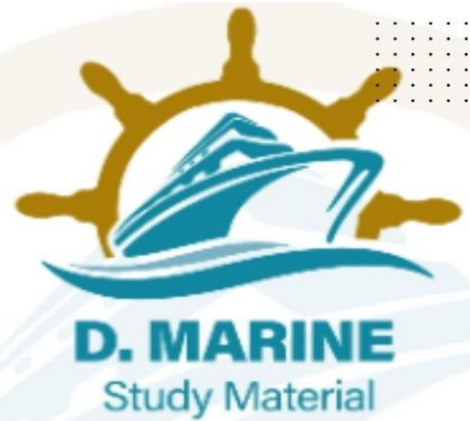
**2024/DEC1/Q4** **2025/APR1/Q4**

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Q5. (a) How will you align a motor-pump shaft? What are the different methods of alignment that can be used? (8)



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(b) Why is the Refrigeration Compressor often belt Driven? (8)

**2024/DEC1/Q5** **2025/APR1/Q5**

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Q6. (a) Explain why a purifier is not attaining its rated speed on starting from rest? (8)

(b) How do you select the appropriate gravity disc of Purifier? Why is this selection an important element in the purifier operation? (8)

**2024/DEC1/Q6** **2025/APR1/Q6**

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Q7. (a) What are the reasons for foaming in refrigeration compressor crankcase? (4)

(b) Describe the causes for the following in the domestic refrigeration system: (3\*4)

(i) Frequent cut-in and cut-out of the compressor (4)

(ii) Lub oil low pressure cut-out of the compressor (4)

(iii) High pressure cut-out of the compressor (4)

(iv) Frosting in the compressor suction side (4)

**2024/DEC1/Q7** **2025/APR1/Q7**

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Q8) (a) Describe the effects of taking fresh water from the shore as feedwater for auxiliary boilers. (5)

(b) Describe the measures taken to reduce these effects. (5)

(c) What is the purpose of deaerator in the boiler feed water system? How is the deaeration achieved? (6)

**2024/DEC1/Q8** **2025/APR1/Q8**

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Q9. Describe the following turbocharger cleaning operations.

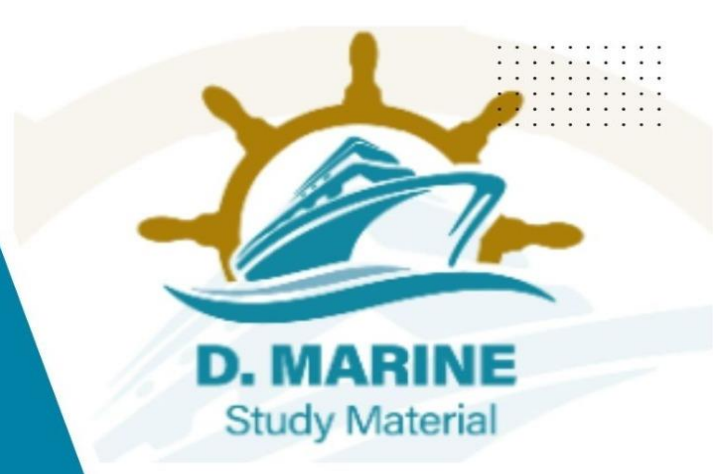
(a) Turbine side water washing. (6)

(b) Turbine side Dry Cleaning. (5)

(c) Blower side water washing (5)



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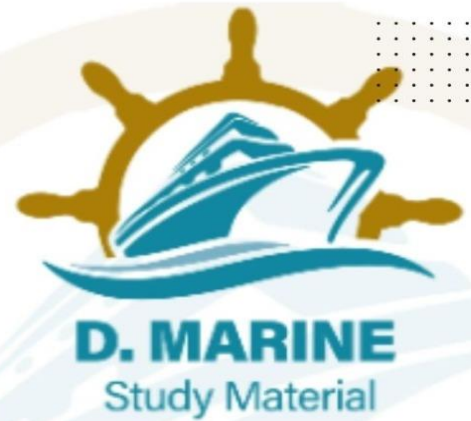
**2023/JUL/Q7** **2024/FEB/Q7** **2024/JUL/Q7** **2024/DEC1/Q9**  
**2025/APR1/Q9**

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## APRIL - 2025 (PART-2)

Q1. Describe the examination you will carry out on the following parts of Air Compressor,

- a) Suction and delivery valves and seats. (4)
- b) Relief valves and bursting discs. (4)
- c) coolers and cooling passages. (4)
- d) Piston and piston rings. (4)

**2022/DEC/Q4** **2023/OCT/Q4** **2025/APR2/Q1**

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Q2. The exhaust temperatures of an auxiliary diesel engine are found to be excessive and uneven at normal load, with dark exhaust at the funnel. Describe EACH of the following:

- a) An investigation of the situation. (5)
- b) The procedure to remedy the immediate problems. (6)
- c) Any further action that might be necessary. (5)

**2022/DEC/Q6** **2023/SEP/Q6** **2023/OCT/Q6** **2023/DEC/Q8**  
**2024/MAR/Q8** **2024/APR2/Q8** **2024/OCT/Q8** **2024/DEC2/Q8**  
**2025/APR2/Q2**

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Q3. A Centrifugal pump has been opened up due to abnormal noise:

- a) List the checks you will carry out on various parts (4)
- b) Name the parts which may require replacement. (4)
- c) Checks to be carried out after assembly. (4)
- d) Operational parameters, which may be required to be compared with manufacturers test records. (4)

**2022/DEC/Q7** **2023/SEP/Q7** **2023/OCT/Q7** **2024/JAN/Q6**  
**2024/JUN/Q6** **2024/NOV/Q6** **2025/APR2/Q3**

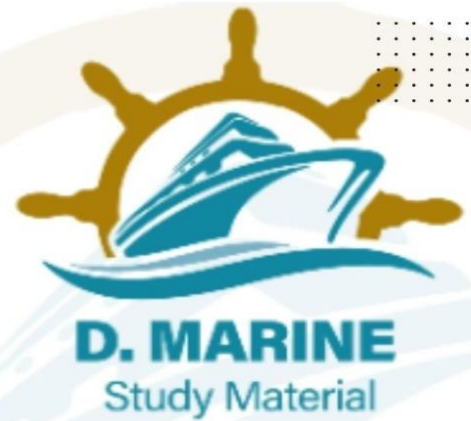
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Q4. With reference to auxiliary boilers

- (a) Briefly describe the maintenance procedures for oil burning equipment.



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- (b) Explain the need for and the use of soot blowers. (5)  
(c) Describe how a boiler should be taken out of service. (6)

**2022/OCT/Q4** **2025/APR2/Q4**

Q5. An air cooler of a large two stroke marine diesel engine is showing poor performance. Suggest some measures you would initiate to rectify the problem and improve the performance. (16)

**2022/OCT/Q4** **2025/APR2/Q5**

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Q6. Briefly explain the following:

- (a) How would you know if a refrigeration system is 'undercharged'? (4)  
(b) What should you do to ensure that there is no water leakage into the engine cylinder before preparing main engine for sea? (4)  
(c) What would be the probable cause of a rise in the level of the lub oil sump tank of a main engine? (4)  
(d) How does the valve rotator as fitted on an exhaust valve of aux. engine work? (4)

**2025/APR2/Q6**

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Q7. With reference to Steering Gear & Hydraulic Power Rotary pumps:

- (a) Explain how the reserve of fluid in the system is checked and how make-up is achieved? (5)  
(b) Describe how a steering system is tested prior to leaving port with reference to SOLAS (5)  
(c) Explain how tests are made for leaks, and air and other gases are bled from the system. (6)

**2025/APR2/Q7**

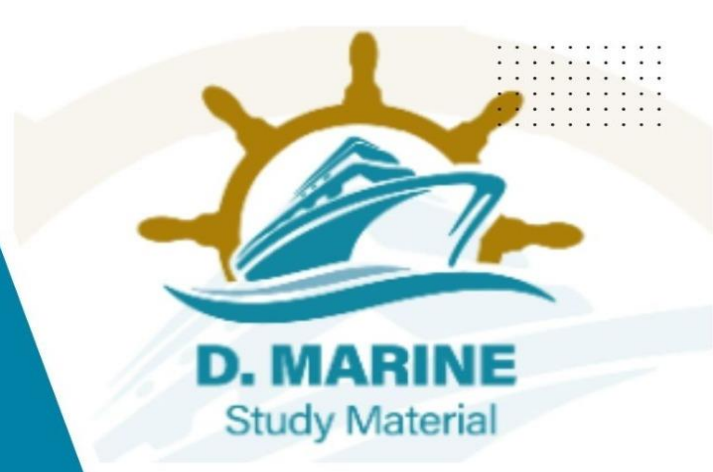
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Q8. With respect to centrifuges.

- (a) Explain the reasons which shall cause a purifier to overflow (6)  
(b) What are reasons that induces vibration in a purifier" (4)



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(c) Explain the process of desludging? Why is the purifier amperage an important parameter for the operator? (6)

**2024/MAR/Q6** **2024/DEC2/Q6** **2025/APR2/Q8**

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Q9. With reference to stuffing box of a two-stroke main engine explain following

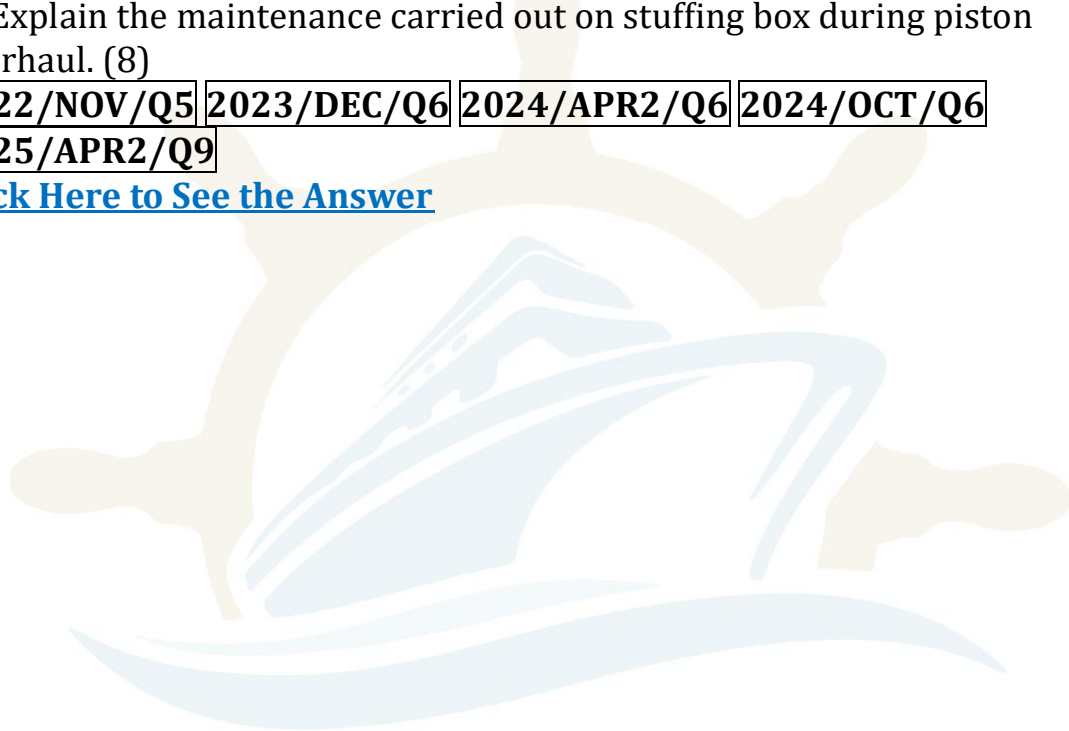
a) Why stuffing box is required in two stroke diesel engines. (8)

b) Explain the maintenance carried out on stuffing box during piston overhaul. (8)

**2022/NOV/Q5** **2023/DEC/Q6** **2024/APR2/Q6** **2024/OCT/Q6**

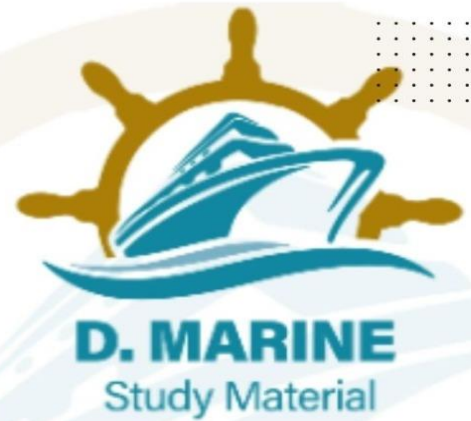
**2025/APR2/Q9**

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## JUNE -2025

Q1. (a) How is fuel (HFO) for a marine diesel engine (main engine) being delivered from a fuel oil storage tank up to the combustion chamber?

Explain with a line diagram. (10)

(b) What is the significance of the following:

(i) Heating arrangement with temperature control. (3)

(ii) Prevention of air lock in the system. (3)

**2024/DEC2/Q1** **2025/JUN/Q1**

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Q2. (a) Describe the components forming part of a Gear Pump. Explain how pumping is carried out by gear pump? (8)

(b) By suitable drawing describe what is 'back lash' and enumerate its importance. How is 'back lash' measured? (4)

(c) What checks will be carried out during overhauls. (4)

**2024/MAR/Q2** **2024/DEC2/Q2** **2025/JUN/Q2**

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Q3. (a) How Leaks are detected and rectified on refrigerating plant? (4)

(b) Describe how suction & discharge valves are tested for tightness? (4)

(c) Describe with an illustration, how refrigerant charging is carried out?

**2024/MAR/Q3** **2024/DEC2/Q3** **2025/JUN/Q3**

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Q4. (a) Describe by drawing a suitable diagram, Bilge water system of an ocean-going ship. Name each part/equipment with its function. (10)

(b) Discuss the commonly associated troubles with the Bilge system and their probable solutions. (6)

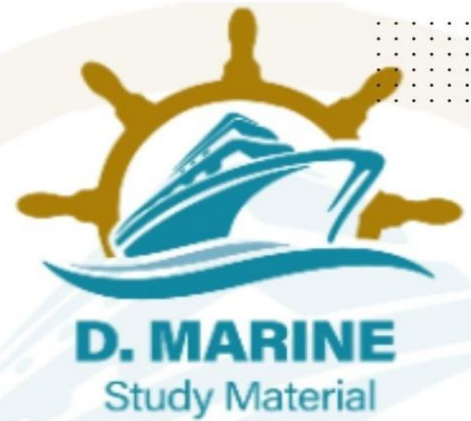
**2024/MAR/Q4** **2024/DEC2/Q4** **2025/JUN/Q4**

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Q5. (a) Describe the uses of packed gland seal. What are the machineries they are in use? In a running pump, how the gland packing is lubricated and



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kept cool? (6)

(b) Describe advantages of using gland packing. (5)

(c) Describe disadvantages of using gland packing. (5)

**2024/MAR/Q5** **2024/DEC2/Q5** **2025/JUN/Q5**

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Q6. With respect to centrifuges.

(a) Explain the reasons which shall cause a purifier to overflow (6)

(b) What are reasons that induces vibration in a purifier" (4)

(c) Explain the process of desludging? Why is the purifier amperage an important parameter for the operator? (6)

**2024/MAR/Q6** **2024/DEC/Q15** **2025/APR/Q17** **2025/JUN/Q6**

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Q7. (a) Explain with a sketch showing the components of an auxiliary engine fuel valve, the complete maintenance procedure including the removal of the fuel valve, pressure-testing and overhaul. (12)

(b) What are the precautions to be taken before installation of a fuel valve on the cylinder head? Indicate the special tools that may be required for the fuel valve removal and overhaul. (4)

**2024/MAR/Q7** **2024/DEC2/Q7** **2025/JUN/Q7**

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Q8. (a) There are three auxiliary engines having separate quick closing valves in the fuel supply line. How will you safely test these valves for each of the engines without causing a blackout? Discuss the process with the help of a diagram. (6)

(b) How will you reset the quick closing valves after the test is completed?

(c) Explain the significance of flywheel marking on a four stroke engine. (6)

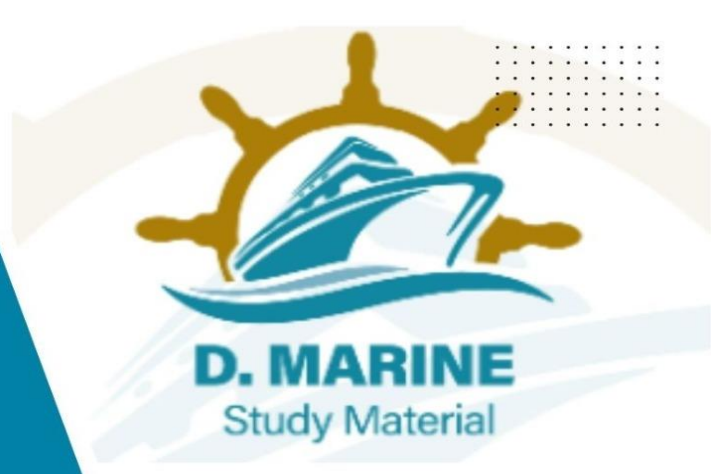
**2025/JUN/Q8**

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Q9. (a) What is Accumulation of pressure test for Boiler and what is its purpose? (6)



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(b) Describe the detailed procedure for an Accumulation of pressure test.

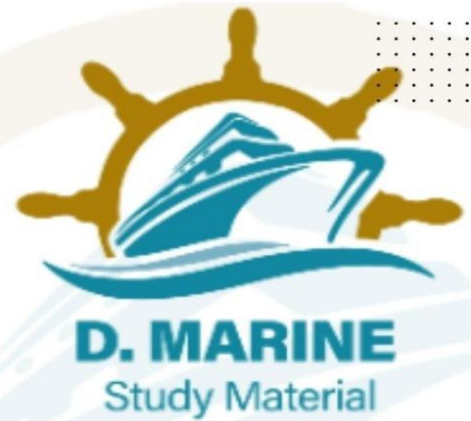
**2024/MAR/Q9** **2024/DEC2/Q9** **2025/JUN/Q9**

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## JULY - 2025

Q1. (a) Explain the circumstances under which a two stroke engine fails to turn on air. (8)

(b) What investigations and corrective actions are required to be taken by you as a watch keeping engineer if the engine does not turn on air after repeated trials? (8)

**2025/JAN1/Q1** **2025/JUL/Q1**

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Q2. Prepare a report to the Chief Engineer stating how an emergency fire pump which had difficulty taking suction earlier during ballast passage of a ship, is now rectified to operate satisfactorily under any acceptable condition of loading of the ship. (16)

**2025/JAN1/Q2** **2025/JUL/Q2**

[Click Here to See the Answer](#)

Q3. Explain in detail how you would isolate one section of a water sprinkler system for routine maintenance. Describe all tests and inspections you would make and how you would return the system to service. (16)

**2022/DEC/Q5** **2023/SEP/Q5** **2023/OCT/Q5** **2024/FEB/Q3**

**2024/JUL/Q3** **2025/JAN1/Q3** **2025/JUL/Q3**

[Click Here to See the Answer](#)

Q4. Describe a procedure for cylinder liner calibration indicating how the readings are recorded to allow for easy recognition of liner wear. (16)

**2024/FEB/Q4** **2024/JUL/Q4** **2025/JAN1/Q4** **2025/JUL/Q4**

[Click Here to See the Answer](#)

Q5. (a) State, with reasons, the causes of fatigue cracking of engineering components. (4)

(b) State, with reasons, how material and design defects can influence fatigue life. (6)

(c) With reference to engine bed plate transverse girders explain how the



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incidence of fatigue cracking can be minimized. (6)

2022/DEC/Q8 2023/SEP/Q8 2023/OCT/Q8 2024/FEB/Q5

2024/JUL/Q5 2025/JAN1/Q5 2025/JUL/Q5

[Click Here to See the Answer](#)

Q6. (a) Describe different components used in soldering process. (6)

(b) Describe soldering process in detail. (6)

(c) What are Do's and Don'ts for good soldering joint. (4)

2023/JUL/Q2 2024/FEB/Q6 2024/JUL/Q6 2025/JAN1/Q6

2025/JUL/Q6

[Click Here to See the Answer](#)

Q7. Write short notes on the following:

(a) The need for taking double bottom tank soundings regularly after a grounding incident. (4)

(b) Need to pre-heat main engines prior to continuous running of the engine. (4)

(c) Utility of pressure gauges on either side of high pressure fuel oil filters.

(d) The purpose of opening indicator cocks before blowing through an engine. (4)

2025/JAN1/Q7 2025/JUL/Q7

[Click Here to See the Answer](#)

Q8. (a) Describe maintenance required on auxiliary boiler burner. (8)

(b) Describe safety features provided on fuel burning system of auxiliary boiler (8)

2023/MAY1/Q9 2023/JUL/Q9 2024/FEB/Q8 2024/JUL/Q8

2025/JAN1/Q8 2025/JUL/Q8

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Q9. (a) Describe what would be the indications of crank case explosion in main engine. (4)

(b) Describe actions to be taken, if there is crank case explosion in main engine. (8)



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(c) Describe means of prevention of crank case explosion. (4)

**2023/JUN/Q2** **2024/FEB/Q9** **2024/JUL/Q9** **2025/JAN1/Q9**

**2025/JUL/Q9**

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## AUGUST - 2025

Q1. Oil traces have been found in the condensate tank of an auxiliary boiler:  
(a) Describe the procedure to trace the source of contamination (8)  
(b) List the contamination with reasons for its occurrence and the precaution to be taken to ensure safety of the boiler (8)

**2024/MAY2/Q1** **2024/AUG/Q1** **2025/AUG/Q1**

[Click Here to See the Answer](#)

Q2. (a) Describe how cylinder liners are checked for wear (5)  
(b) Explain how these measurements are recorded (5)  
(c) Explain why allowance for wear is limited and what extent of the wear governs liner replacement (6)

**2024/MAY2/Q2** **2024/AUG/Q2** **2025/AUG/Q2**

[Click Here to See the Answer](#)

Q3. State some built in measures by which the steering gear mechanism can be kept operational, in the event of breakages, pipe failures, motor burn out etc. (16)

**2024/MAY2/Q3** **2024/AUG/Q3** **2025/AUG/Q3**

[Click Here to See the Answer](#)

Q4. Where a waste heat boiler is subject to persistent leakage at the tube / tube plate connection, suggest with sketches, methods of effecting a permanent repair. (16)

**2024/MAY2/Q4** **2024/AUG/Q4** **2025/AUG/Q4**

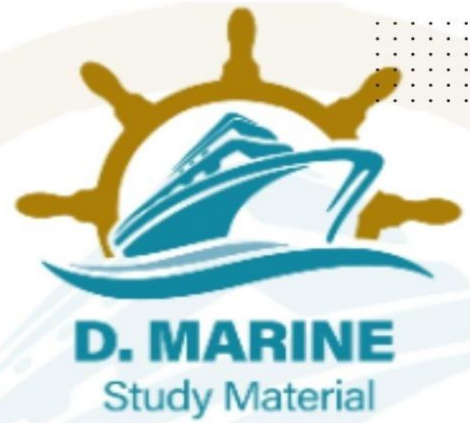
[Click Here to See the Answer](#)

Q5. (a) What are the routines carried out on a lifeboat winch (6)  
(b) What maintenance do the hand brake and Centrifugal brakes require  
(c) At what lowering velocity does the centrifugal brake operate (5)

**2024/MAY2/Q5** **2024/AUG/Q5** **2025/AUG/Q5**



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Q6. Give reasons and remedies for the following faults in air compressors.

- (a) Excessively hot discharge pipe (5)
- (b) Intermediate stage relief valve lifting (5)
- (c) Noticeable reduction in free air delivery (6)

**2024/MAY2/Q6** **2024/AUG/Q6** **2025/AUG/Q6**

[Click Here to See the Answer](#)

Q7. With reference to auxiliary boiler safety valves state with reasons:

- (a) What clearances need checking when lapping valves to seats (5)
- (b) Why the drain must be clear (5)
- (c) Why opening gear should be kept in good working order at all times (6)

**2024/MAY2/Q7** **2024/AUG/Q7** **2025/AUG/Q7**

[Click Here to See the Answer](#)

Q8. With reference to a fuel oil purifier:

- (a) What are the reasons that may cause the purifier to overflow? (6)
- (b) What are the reasons for the water carry-over with the oil? (5)
- (c) What are the probable reasons for vibration seen during purifier starting? (5)

**2024/MAY2/Q8** **2024/AUG/Q8** **2025/AUG/Q8**

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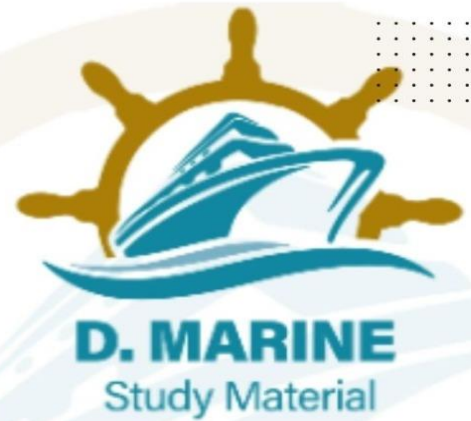
Q9. Explain with a suitable diagram, the components of an auxiliary engine fuel valve? Briefly explain, the process of overhauling and pressure testing the fuel valve? (16)

**2024/MAY2/Q9** **2024/AUG/Q9** **2025/AUG/Q9**

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## SEPTEMBER - 2025

Q1. Describe the examination you will carry out on the following parts of Air Compressor,

- a) Suction and delivery valves and seats. (4)
- b) Relief valves and bursting discs. (4)
- c) coolers and cooling passages. (4)
- d) Piston and piston rings. (4)

**2022/DEC/Q4** **2023/OCT/Q4** **2025/APR2/Q1** **2025/SEP/Q1**

[Click Here to See the Answer](#)

Q2. The exhaust temperatures of an auxiliary diesel engine are found to be excessive and uneven at normal load, with dark exhaust at the funnel. Describe EACH of the following:

- a) An investigation into the situation. (5)
- b) The procedure to remedy the immediate problems, an identified. (6)
- c) Any further action that might be considered necessary. (5)

**2022/DEC/Q6** **2023/SEP/Q6** **2023/OCT/Q6** **2023/DEC/Q8**  
**2024/MAR/Q8** **2024/APR2/Q8** **2024/OCT/Q8** **2024/DEC2/Q8**  
**2025/APR2/Q2** **2025/SEP/Q2**

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Q3. A Centrifugal pump has been opened up due to abnormal noise:

- a) List the checks you will carry out on various parts (4)
- b) Name the parts which may require replacement. (4)
- c) Checks to be carried out after assembly. (4)
- d) Operational parameters, which may be required to be compared with manufacturers test records. (4)

**2022/DEC/Q7** **2023/SEP/Q7** **2023/OCT/Q7** **2024/JAN/Q6**  
**2024/JUN/Q6** **2024/NOV/Q6** **2025/APR2/Q3** **2025/SEP/Q3**

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Q4. With reference to auxiliary boilers

- (a) Briefly describe the maintenance procedures for oil burning equipment.



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(5)

(b) Explain the need for and the use of soot blowers. (5)

(c) Describe how a boiler should be taken out of service. (6)

**2022/OCT/Q4** **2025/APR2/Q4** **2025/SEP/Q4**

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Q5. An air cooler of a large two stroke marine diesel engine is showing poor performance. Suggest some measures you would initiate to rectify the problem and improve the performance. (16)

**2022/OCT/Q4** **2025/APR2/Q5** **2025/SEP/Q5**

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Q6. Briefly explain the following:

(a) How would you know if a refrigeration system is 'undercharged'? (4)

(b) What should you do to ensure that there is no water leakage into the engine cylinder before main engine for sea? (4)

(c) What would be the probable cause of a rise in the level of the lub oil sump tank of a main engine? (4)

(d) How does the valve rotator as fitted on an exhaust valve of aux. engine work? (4)

**2025/APR2/Q6** **2025/SEP/Q6**

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Q7. With reference to Steering Gear & Hydraulic Power Rotary pumps:

(a) Explain how the reserve of fluid in the system is checked and how make-up is achieved? (5)

(b) Describe how a steering system is tested prior to leaving port with reference to SOLAS (5)

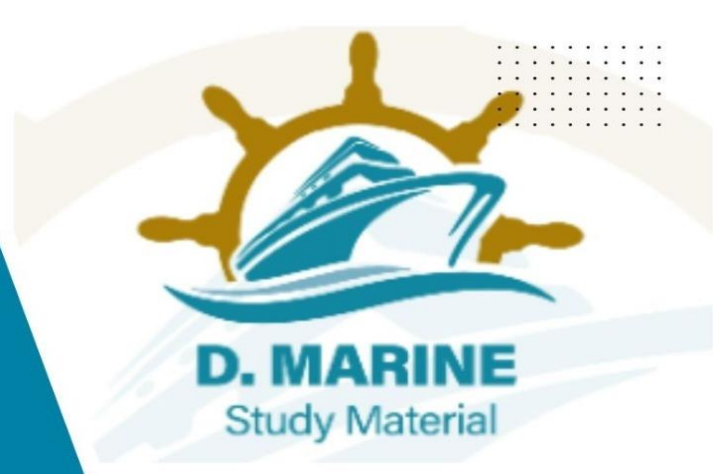
(c) Explain how tests are made for leaks, and air and other gases are bled from the system. (6)

**2025/APR2/Q7** **2025/SEP/Q7**

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Q8. (a) What are some key components of a heat exchanger that you would examine closely during a maintenance check? (8)

(b) How is leakage detected in plate-type and shell-and-tube heat exchangers? (8)

**2025/SEP/Q8**

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Q9. With reference to stuffing box of a two-stroke main engine explain following

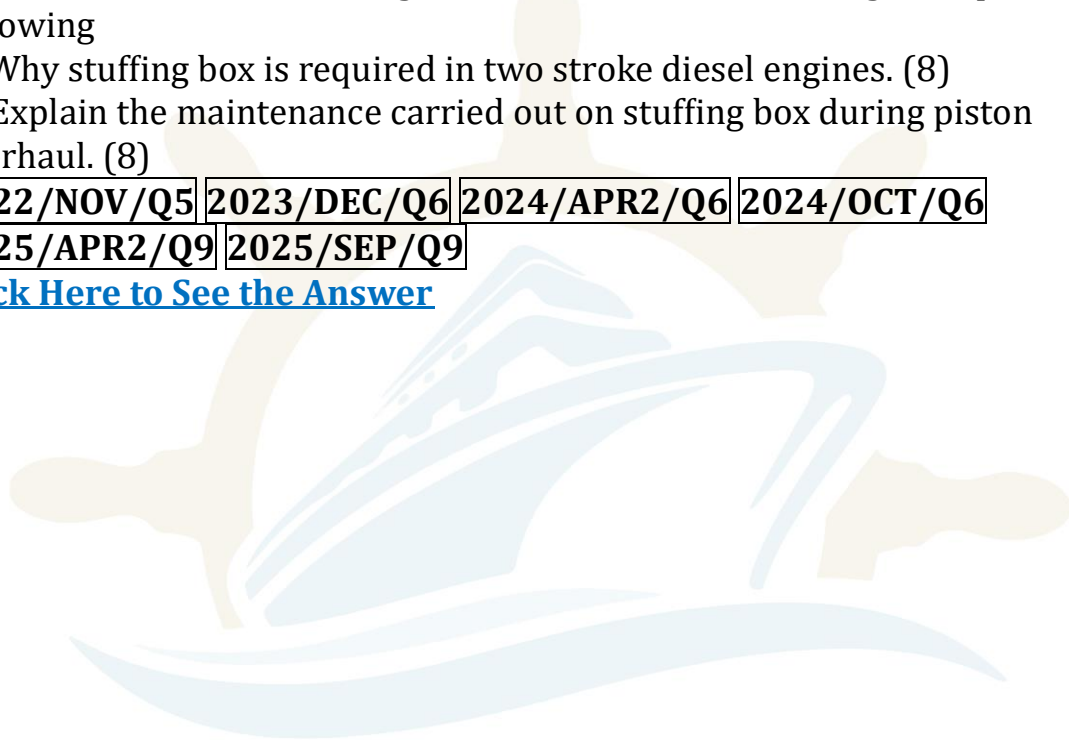
a) Why stuffing box is required in two stroke diesel engines. (8)

b) Explain the maintenance carried out on stuffing box during piston overhaul. (8)

**2022/NOV/Q5** **2023/DEC/Q6** **2024/APR2/Q6** **2024/OCT/Q6**

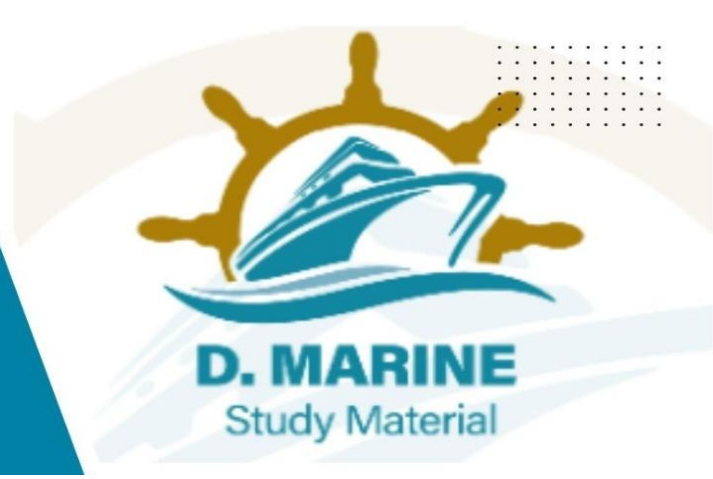
**2025/APR2/Q9** **2025/SEP/Q9**

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## OCTOBER - 2025

Q1. (a) Describe how leak in a Heat exchanger tube is detected? How to rectify leaky tube? (8)

(b) What are the common methods to enhance heat transfer of heat exchanger? (4)

(c) Describe reasons for poor performance of heat exchanger and actions to rectify the same. (4)

**2024/MAR/Q1** **2024/DEC1/Q1** **2025/APR1/Q1** **2025/OCT/Q1**

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Q2. Describe the Stern Tube Lubrication System by drawing a schematic diagram and explaining function of each component. (16)

**2024/JAN/Q2** **2024/DEC1/Q2** **2025/APR1/Q2** **2025/OCT/Q2**

[Click Here to See the Answer](#)

Q3. With respect to the properties of fuel oil, explain the significance of the following terms.

(a) Calculated Carbon Aromaticity Index (CCAI). (4)

(b) The importance of Sodium to Vanadium Ratio. (4)

(c) Sulphur content. (4)

(d) Pour point. (4)

**2024/DEC1/Q3** **2025/APR1/Q3** **2025/OCT/Q3**

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Q4. (a) What causes cavitation in a Centrifugal pump operation? (6)

(b) If the Engine room Bilge pump not taking suction, explore the probable reasons? (6)

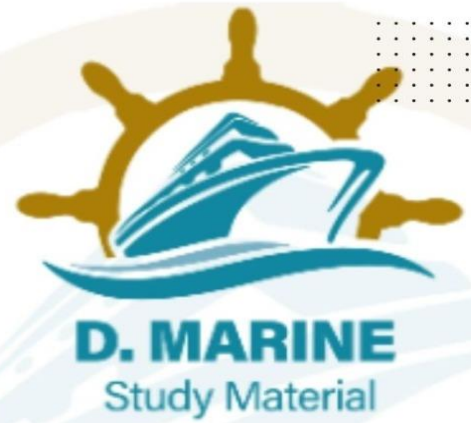
(c) Why is a centrifugal pump started with its discharge valve shut? (4)

**2024/DEC1/Q4** **2025/APR1/Q4** **2025/OCT/Q4**

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Q5. (a) How will you align a motor-pump shaft? What are the different methods of alignment that can be used? (8)

(b) Why is the Refrigeration Compressor often belt Driven? (8)

**2024/DEC1/Q5** **2025/APR1/Q5** **2025/OCT/Q5**

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Q6. (a) Explain why a purifier is not attaining its rated speed on starting from rest? (8)

(b) How do you select the appropriate gravity disc of Purifier? Why is this selection an important element in the purifier operation? (8)

**2024/DEC1/Q6** **2025/APR1/Q6** **2025/OCT/Q6**

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Q7. (a) What are the reasons for foaming in refrigeration compressor crankcase? (4)

(b) Describe the causes for the following in the domestic refrigeration system: (3\*4)

(i) Frequent cut-in and cut-out of the compressor (4)

(ii) Lub oil low pressure cut-out of the compressor (4)

(iii) High pressure cut-out of the compressor (4)

(iv) Frosting in the compressor suction side (4)

**2024/DEC1/Q7** **2025/APR1/Q7** **2025/OCT/Q7**

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Q8) (a) Describe the effects of taking fresh water from the shore as feedwater for auxiliary boilers. (5)

(b) Describe the measures taken to reduce these effects. (5)

(c) What is the purpose of deaerator in the boiler feed water system? How is the deaeration achieved? (6)

**2024/DEC1/Q8** **2025/APR1/Q8** **2025/OCT/Q8**

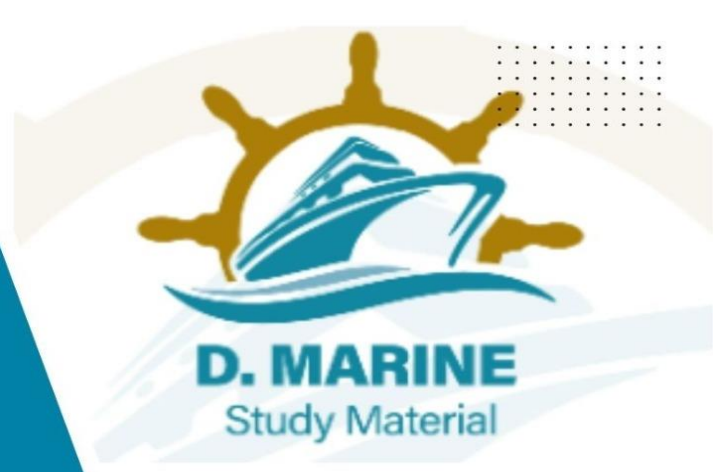
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Q9. Describe the following turbocharger cleaning operations.

(a) Turbine side water washing. (6)



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(b) Turbine side Dry Cleaning. (5)

(c) Blower side water washing (5)

2023/JUL/Q7 | 2024/FEB/Q7 | 2024/JUL/Q7 | 2024/DEC1/Q9

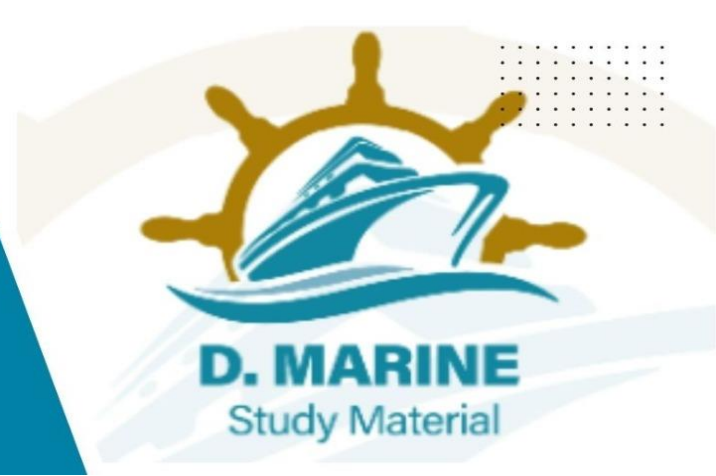
2025/APR1/Q9 | 2025/OCT/Q9

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## NOVEMBER - 2025

- Q1. (a) State FOUR reasons for persistent slackening of holding down bolts of a main engine. (6)  
(b) State FOUR precautions to be observed when fitting non-metallic chocks in order to ensure accurate choking. (4)  
(c) State the periodic checks to be made in order to assess the effectiveness of an engine chocking system. (6)

**2024/MAY1/Q1** **2024/SEP1/Q1** **2025/FEB/Q1** **2025/NOV/Q1**

[Click Here to See the Answer](#)

Q2. A biological sewage system develops a fault, which necessitates opening the unit for repair.

- (a) The risk associated with opening the unit. (6)  
(b) The precaution taken to reduce the risk. (6)  
(c) Explain the significance of biological oxygen demand (B.O.D.). (4)

**2023/AUG/Q5** **2024/MAY1/Q2** **2024/SEP1/Q2** **2025/FEB/Q2**  
**2025/NOV/Q2**

[Click Here to See the Answer](#)

Q3. Work is being carried out in drydock on a large sea water inlet chest and the valves. Describe the inspection you would carry out:

- (a) As the work starts (8)  
(b) During and after the work. (8)

**2023/APR/Q6** **2024/MAY1/Q3** **2024/SEP1/Q3** **2025/FEB/Q3**  
**2025/MAR/Q5** **2025/NOV/Q3**

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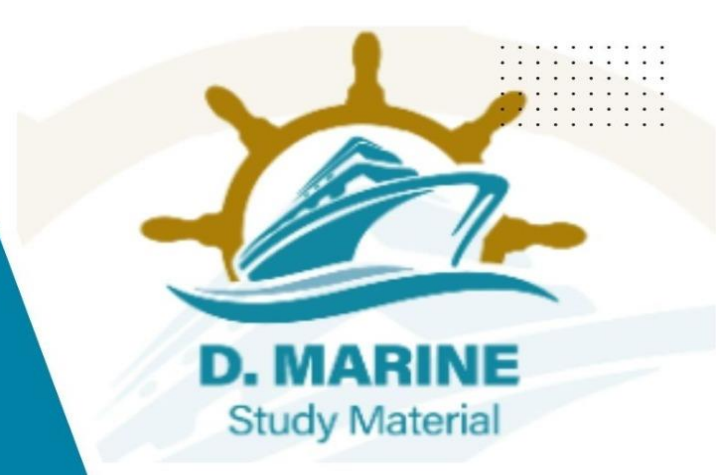
Q4. (a) How are heat exchangers protected from the effects of corrosion?  
(b) What are the problems associated with biofouling? (8)

**2024/MAY1/Q4** **2024/SEP1/Q4** **2025/FEB/Q4** **2025/NOV/Q4**

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Q5. Describe the procedure for the regular maintenance routines to be carried out on the Fixed CO2 fire-fighting system. (16)

**2024/MAY1/Q5** **2024/SEP1/Q5** **2025/FEB/Q5** **2025/NOV/Q5**

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Q6. A jacket cooling water, plate type cooler for the engine system is stripped open during overhaul for survey purposes, State out a list of components, parts or areas, which you would like to particularly check yourself before the survey. (16)

**2024/MAY1/Q6** **2024/SEP1/Q6** **2025/FEB/Q6** **2025/NOV/Q6**

[Click Here to See the Answer](#)

Q7. During the watch main engine crank case mist detector alarm has sounded.

(a) List the steps to be taken to meet this emergency situation. (8)

(b) Subsequent inspection and action required to put the engine on normal operation (8)

**2022/SEP/Q8** **2024/MAY1/Q7** **2024/SEP1/Q7** **2025/FEB/Q7**

**2025/NOV/Q7**

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Q8. With reference to starting air receivers:

(a) Explain why starting air receivers should be drained frequently. (6)

(b) Describe the procedure for the inspection of the internal surfaces of an receiver, indicating the possible defects, which may be encountered. (10)

**2024/MAY1/Q8** **2024/SEP1/Q8** **2025/FEB/Q8** **2025/NOV/Q8**

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Q9. During recent periods of manoeuvring, a number of air start valve bursting discs or cones have failed. In the circumstance, indicate how the actual cause might be:

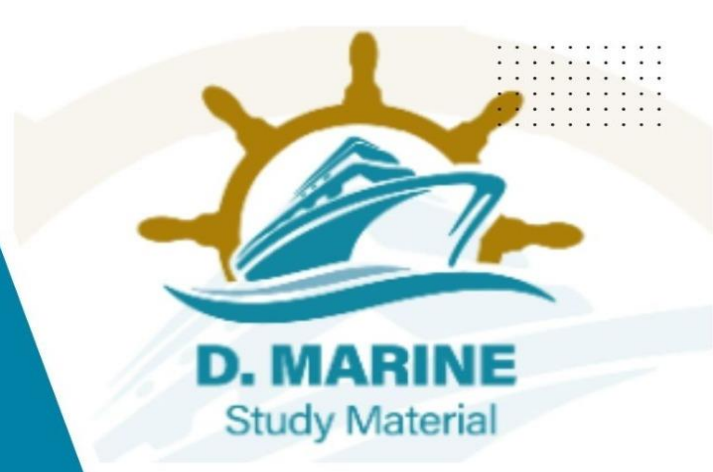
(a) Detected (8)

(b) Rectified (8)

**2024/MAY1/Q9** **2024/SEP1/Q9** **2025/FEB/Q9** **2025/NOV/Q9**



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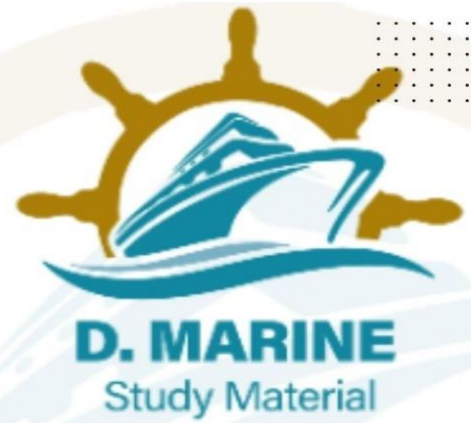


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## DECEMBER – 2025

Q1. (a) How is fuel (HFO) for a marine diesel engine (main engine) being delivered from a fuel oil storage tank up to the combustion chamber?

Explain with a line diagram. (10)

(b) What is the significance of the following:

(i) Heating arrangement with temperature control. (3)

(ii) Prevention of air lock in the system. (3)

**2024/DEC2/Q1** **2025/JUN/Q1** **2025/DEC/Q1**

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Q2. (a) Describe the components forming part of a Gear Pump. Explain how pumping is carried out by gear pump? (8)

(b) By suitable drawing describe what is 'back lash' and enumerate its importance. How is 'back lash' measured? (4)

(c) What checks will be carried out during overhauls. (4)

**2024/MAR/Q2** **2024/DEC2/Q2** **2025/JUN/Q2** **2025/DEC/Q2**

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Q3. (a) How Leaks are detected and rectified on refrigerating plant? (4)

(b) Describe how suction & discharge valves are tested for tightness? (4)

(c) Describe with an illustration, how refrigerant charging is carried out?

**2024/MAR/Q3** **2024/DEC2/Q3** **2025/JUN/Q3** **2025/DEC/Q3**

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Q4. (a) Describe by drawing a suitable diagram, Bilge water system of an ocean-going ship. Name each part/equipment with its function. (10)

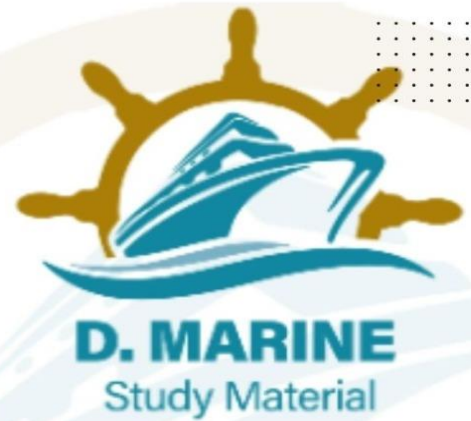
(b) Discuss the commonly associated troubles with the Bilge system and their probable solutions. (6)

**2024/MAR/Q4** **2024/DEC2/Q4** **2025/JUN/Q4** **2025/DEC/Q4**

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Q5. (a) Describe the uses of packed gland seal. What are the machineries they are in use? In a running pump, how the gland packing is lubricated and kept cool? (6)

(b) Describe advantages of using gland packing. (5)

(c) Describe disadvantages of using gland packing. (5)

**2024/MAR/Q5** **2024/DEC2/Q5** **2025/JUN/Q5** **2025/DEC/Q5**

[Click Here to See the Answer](#)

Q6. With respect to centrifuges.

(a) Explain the reasons which shall cause a purifier to overflow (6)

(b) What are reasons that induces vibration in a purifier" (4)

(c) Explain the process of desludging? Why is the purifier amperage an important parameter for the operator? (6)

**2024/MAR/Q6** **2024/DEC/Q5** **2025/APR/Q7** **2025/JUN/Q6**

**2025/DEC/Q6**

[Click Here to See the Answer](#)

Q7. (a) Explain with a sketch showing the components of an auxiliary engine fuel valve, the complete maintenance procedure including the removal of the fuel valve, pressure-testing and overhaul. (12)

(b) What are the precautions to be taken before installation of a fuel valve on the cylinder head? Indicate the special tools that may be required for the fuel valve removal and overhaul. (4)

**2024/MAR/Q7** **2024/DEC2/Q7** **2025/JUN/Q7** **2025/DEC/Q7**

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Q8. (a) There are three auxiliary engines having separate quick closing valves in the fuel supply line. How will you safely test these valves for each of the engines without causing a blackout? Discuss the process with the help of a diagram. (6)

(b) How will you reset the quick closing valves after the test is completed?

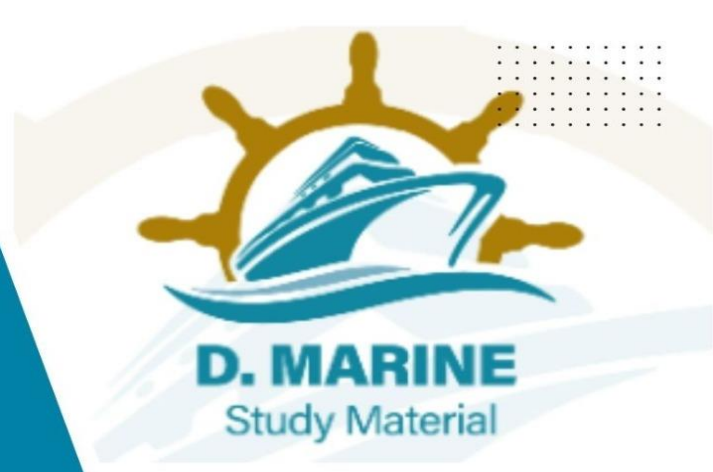
(c) Explain the significance of flywheel marking on a four stroke engine. (6)

**2025/JUN/Q8** **2025/DEC/Q8**

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Q9. (a) What is Accumulation of pressure test for Boiler and what is its purpose? (6)  
(b) Describe the detailed procedure for an Accumulation of pressure test.

**2024/MAR/Q9** **2024/DEC2/Q9** **2025/JUN/Q9** **2025/DEC/Q9**

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