D. MARINE
Study Material

MEO CLASS 2 WRITTEN: MEP

(MARINE ENGINEERING PRACTICE)

FOR INDIAN COMPETENCY EXAM

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D. MARINE
Study Material

JAN-2026

1. Describe the procedure to be undertaken for overhaul of an oil cooled Main Engine Piston detailing the DEM tools used for overhauling the piston. Also, describe the procedure for testing of the Main engine oil cooled Piston after overhaul. (16)
Click Here to See the Answer

2 It is found that the Main engine cylinder head studs are breaking during voyage:
a) State, with reasons, the possible causes. (6)
b) State, with reasons and the likely effects on the engine if it is allowed to operate with broken studs. A (5)
c)Explain how this problem can be minimized? (5)
Click Here to See the Answer

3. Describe the procedure for carrying out the rocking test of a deck electrohydraulic cranc. Please explain how will you ensure that you get the correct readings and how do you interpret the readings obtained from this test for planning future overhauls of the crane. (16)
Click Here to See the Answer

4. During the overhaul of medium-speed auxiliary diesel generator you find that the white metal of one of the bottom end bearings has cracked. Explain how you would fit a spare bearing and enumerate the various tests you would carry before putting the machine back into service. (16)
2022/JUL/07 **2024/OCT/06** **2025/APR/07**
Click Here to See the Answer

5. Under Continuous survey of machinery (CSM) the bottom end bearing of a large slow speed engine is due for survey.
(a) As Second Engineer, explain the procedure involved in complete inspection of a bottom end bearing
(b) List the precaution to be taken during inspection. (4)
(c) What tests are carried out on completion of survey and re-assembly.

(d)A Plate type LT cooler of the centralized cooling water system on your ship is showing poor performance. What measures you would initiate to rectify the problem and improve the performance. (16)

2021/JAN/01 **2021/OCT/09** **2021/DEC/02** **2022/FEB/06**
2021/APR/01 **2024/JAN/01** **2024/JUN/07** **2025/JAN/01**

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6. As a second engineer in a ocean going ship, what actions you will take if the specification of the bunkers received in the last port is substantially different than the old bunkers with respect to:
(a) density
(b) Viscosity
(c) Cat fines
(d) Sulphur content
(e) Water content (16)

Click Here to See the Answer

7. With reference to a domestic refrigeration system
(a) What are the indications of overcharge, undercharge and air ingress into the system? (8)
(b) How are the above abnormalities rectified? (8)

Click Here to See the Answer

8. What is understood by risk on board ship? As a 2nd engineer discuss various methods for hazard identification and assessment of risk available on board. (16)

Click Here to See the Answer

9. Sewage treatment plant is due for internal inspection. List in detail the procedure along with various parts to be included in the inspection and the safety precautions for carrying out the inspection of the STP.

Click Here to See the Answer

FEB-2026

1. Describe the procedure to be undertaken when, upon a routine schedule for changing **Exhaust Valve** on a main engine, it is found that the Exhaust valve body is seized inside the cylinder head and cannot be removed by conventional means and the internal threads in the exhaust valve body connecting to the exhaust bellows are damaged. (16)
2023/AUG/01 **2023/OCT/09** **2025/AUG/02** **2026/FEB/01**
Click Here to See the Answer

2. it is found that the tie rods are persistently becoming slack:
a) State, with reasons, the possible causes.
b) State, with reasons, the likely effects on the engine if it is allowed to operate with slack tie rods.
c)Explain how this problem can be minimized? (5)
2023/AUG/02 **2026/FEB/02**
Click Here to See the Answer

3a) Briefly explain the term metal fatigue and further explain how fatigue failure occurs. (4)
b) State the difference between high stress/low cycle and low stress/high cycle fatigue giving an example of each (4)
c)State how defects in the metal can influence the expected safe life of a component
d)State how fuel injection timing and cylinder power balance can influence the possibility of fatigue cracks developing in the bedplate.
Click Here to See the Answer

4 With reference to air receivers and bottles explain with reasons:
a) Why regular systematic internal inspection is advisable. (4)
b) Which internal areas of large receivers should receive particularly close examination? (4)
c)How bottles are inspected internally and what parts should be closely examined?

d) How the condition of a bottle or receiver that cannot be inspected internally is checked (4)
2023/JAN/07 **2023/AUG/04** **2024/APR/07** **2026/FEB/04**
Click Here to See the Answer

5. List the maintenance routines you plan to carry out on the deck hydraulic cranes, winches, and mooring machineries before arrival port after a long voyage, considering the fact that cargo operation is solely dependent on the proper Functioning of the crane and winches (16)
2023/AUG/05 **2026/FEB/05**

6. With reference to the crankshaft deflection of main engine crank shaft,
(a) State the ideal condition required before taking deflections. (6)
(b) How is the accuracy of the reading taken are ensured? (6)
(c) What is the purpose of taking deflection and how is the readings taken interpreted? (4)
Click Here to See the Answer

7. Describe the procedure for overhauling a boiler safety valve and explain using sketches where necessary those parts, which require close attention. Also describe the procedure setting of boiler safety valves
2021/AUG/03 **2022/JAN/02** **2022/APR/05**
Click Here to See the Answer

8. The LT cooler of the centralized cooling water system on your ship is showing poor performance. What measures you would initiate to rectify the problem and improve the performance. (16)
2025/JUL/04 **2025/OCT/04** **2026/FEB/08**
Click Here to See the Answer

9. With reference to the auxiliary engine big end bearing.
(a) State the various inspections done on the bearing shells, crank plo, serrations on the con-md and bolts. (6)
(b) How is the bearing assembled after inspection? (4)
(c) Describe the various checks carried out after assembling the bearing. (6)

Click Here to See the Answer

MAR-2026

Q1. Suggest a procedure (in about 200 words) to the Chief Engineer, on how you propose to ensure that the engine room overhead crane is maintained and operated correctly. What tests certificates are required for the overhead crane, and who is the issuing authority. (16)
2023/JULY/Q5 **2024/APR/Q1** **2026/MAR/Q1**
Click Here to See the Answer

Q2. A. Describe the survey procedure of an oil lubricated stern bearing and shaft. (8)
B. Explain how the integrity of the outboard seal of an oil lubricated stern tube may be proved before the dry-dock is flooded. (8)
2022/NOV-Q1 **2024/APR/Q2** **2024/DEC/Q6** **2026/MAR/Q2**
Click Here to See the Answer

Q3. Fatigue is one of the main causes of crankshaft failure.
A. Indicate on a sketch the most likely location of a fatigue crack. (4)
B. Explain how a fatigue failure is identified. (4)
C. Describe how a fatigue crack may be initiated. (4)
D. Describe, with the aid of sketches, the methods used to inhibit fatigue cracks. (4)
2022/NOV/Q5 **2024/APR/Q3** **2026/MAR/Q3**
Click Here to See the Answer

Q4. An auxiliary engine exhibits a tendency to hunt to such an extent that the engine speed variation
prohibits the connection of the machine to the switchboard.
A. Discuss the possible causes of hunting. (8)
B. Explain how the problem of hunting can be rectified. (8)
2024/APR/Q4 **2026/MAR/Q4**
Click Here to See the Answer

Q5. For a fully automatic provisions refrigeration system incorporating a number of rooms.
A. Explain how each room temperature is set. (4)
B. Describe the sequence of events following a demand for increased refrigerant flow from one room. (4)
C. State with reasons the devices incorporated into the system to protect the machinery and equipment against malfunction. (4)
D. State how satisfactory operation of the plant can be established? (4)
2022/DEC/Q8 **2024/APR/Q5** **2025/MAR/Q7** **2026/MAR/Q5**
Click Here to See the Answer

Q6. One of the F.O. Storage tank in the engine room is due for survey by classification society. Keeping in mind the safety of personnel, Enlist the procedure you will follow, to prepare the same for internal examination. (16)
2026/MAR/Q6
Click Here to See the Answer

Q7. With reference to starting air line systems (16)
a) List causes leading to starting airline explosion on a 2 stroke engine.
b) List indications that will give warning of above.
c) List action, precautions and maintenance required to prevent above.
2026/MAR/Q7
Click Here to See the Answer

Q8. Describe the hull inspection that you would carry out as the senior engineer of ship in dry dock stating what defects, you may find and the repairs that may be necessary with respect to:
A. Shell plating.
B. Forward end of ship.
C. Aft end of ship.
D. Opening in shell plating.
E. Rudder.
F. Propeller and stern tube. (16)
2024/APR/Q8 **2026/MAR/Q8**
Click Here to See the Answer

Q9. With reference to Auxiliary boiler safety valves.
A. Describe, with the aid of a sketch, the safety valve for an auxiliary boiler.
B. Identify with reasons, the parts that require particularly close attention during overhaul. (5)
C. Describe how the safety valves are reset after an overhaul. (5)
2021/FEB/Q4 **2021/APR/Q5** **2021/OC/Q5** **2022/MAR/Q4** **2022/JUN/Q8** **2024/APR/Q9** **2025/NOV/Q1** **2026/MAR/Q9**
Click Here to See the Answer

APR – 2026

1. Describe the procedure to be undertaken when, upon a routine schedule for changing Exhaust Valve on a main engine, it is found that the Exhaust valve body is seized inside the cylinder head and cannot be removed by conventional means and the internal threads in the exhaust valve body connecting to the exhaust bellows are damaged.
2023/AUG/Q1 **2023/OCT/Q9** **2025/AUG/Q2** **2026/FEB/Q1** **2026/APR/Q1**
Click Here to See the Answer

2. It is found that the tie rods are persistently becoming slack:
(a) State, with reasons, the possible causes. [6]
(b) State, with reasons, the likely effects on the engine if it is allowed to operate with slack tie rods. [5]
(c) Explain how this problem can be minimized? [5]
2023/AUG/Q2 **2026/FEB/Q2** **2026/APR/Q2**
Click Here to See the Answer

3.a) Briefly explain the term metal fatigue and further explain how fatigue failure occurs.[4×4]
(b) State the difference between high stress/low cycle and low stress/high cycle fatigue giving an example of each.
(c) State how defects in the metal can influence the expected safe life of a

component.
(d) State how fuel injection timing and cylinder power balance can influence the possibility of fatigue cracks developing in the bedplate.
2021/JAN/Q9 **2022/AUG/Q6** **2023/AUG/Q3** **2026/FEB/Q3** **2026/APR/Q3**
Click Here to See the Answer

4. With reference to air receivers and bottles explain with reasons:
(a) Why regular systematic internal inspection is advisable.
(b) Which internal areas of large receivers should receive particularly close attention.
(c) How bottles are inspected internally and what parts should be closely examined?
(d) How the condition of a bottle or receiver that cannot be inspected internally is checked.
2023/JAN/Q7 **2023/AUG/Q4** **2024/APR/Q7** **2026/FEB/Q4** **2026/APR/Q4**
Click Here to See the Answer

5. List the maintenance routines you plan to carry out on the deck hydraulic cranes, winches, and mooring machineries before arrival port after a long voyage, considering the fact that cargo operation is solely dependent on the proper functioning of the cranes. [16]
2023/AUG/Q5 **2026/FEB/Q5** **2026/APR/Q5**
Click Here to See the Answer

6. With reference to the crankshaft deflection of main engine crank shaft,
(a) State the ideal condition required before taking deflections. [6]
(b) How is the accuracy of the reading taken at ensured? [6]
(c) What is the purpose of taking deflection and how is the readings taken interpreted? [4]
2026/FEB/Q6 **2026/APR/Q6**
Click Here to See the Answer

7. Describe the procedure for overhauling a boiler safety valve and explain using sketches where necessary those parts, which require close attention. Also describe the procedure setting of boiler safety valves. [16]
2021/APR/Q5 **2023/AUG/Q7** **2026/FEB/Q7** **2026/APR/Q7**
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8. Severe engine vibration has recently become evident when the main engine for which you are responsible operates within a certain speed range.
(a) State, with reasons, the possible causes of such vibration.[6]
(b) State the consequences of operating the engine under such vibratory conditions.[5]
(c) Describe the procedure you, as Second Engineer, would implement in order to investigate and rectify the problem. [5]
2021/JAN/Q8 **2021/JUL/Q9** **2021/DEC/Q9** **2023/AUG/Q8** **2026/FEB/Q8** **2026/APR/Q8**
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9.With reference to the auxiliary engine big end bearing,
(a) State the various inspections done on the bearing shells, crank pin, serrations on the con-rod and bolts. [6]
(b) How is the bearing assembled after inspection? [4]
(c) Describe the various checks carried out after assembling the bearing.
2026/FEB/Q9 **2026/APR/Q9**
Click Here to See the Answer