



UK MARINE TRAINING CENTRE (UMTC)

SAI POOJA BUILDING, SHOP NO. 4, PLOT NO. 36, SECTOR - 34. KAMOTHE, NAVI
MUMBAI - 410 209 MAHARASHTRA, INDIA.

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MARCH 2013

Attempt SIX questions only

Marks for each part question are shown in brackets

Q1. (a) Write a procedure for the action a duty engineer should take on being called to the engine room during a UMS period in the event of an engine slowdown due to a high scavenge temperature alarm on the main propulsion engine. (6)

(b) State, with reasons, the possible causes of a high scavenge temperature on a main propulsion engine. (4)

(c) Explain why a condition resulting in the activation of high scavenge temperature alarm can cause engine damage if the engine is not slowed down when the fault initially occurs. (6)

2013/March						
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Q2. (a) State why Direct Water Injection is used on some diesel engines, explaining how it performs the intended duty. (8)

(b) Describe, with the aid of a sketch, a Direct Water Injection system. (8)

2013/March						
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Q3. With reference to diesel engine crankshafts:

(a) explain the causes and effects of torsional vibration; (4)

(b) explain the term critical speed, stating why the engine should not be continuously operated at this speed; (6)

(c) explain the term fatigue cracking, stating, with reasons, TWO factors which have an influence on the likelihood of fatigue cracking. (6)

2013/March						
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Q4. With reference to a slow speed diesel engine fitted with a single turbocharger, describe, with reasons, the possible action which could be taken to enable the main engine to be operated, if whilst on oceanic passage, a small portion of one of the impeller vanes breaks off and impacted with the charge air cooler. (16)

2013/March						
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Q5. (a) Describe the procedure for checking and adjusting the timing of a main engine fuel injection pump. (8)

(b) Explain how diesel engine power balance is achieved, stating why it is essential. (8)

2013/March						
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Q6. (a) Describe the symptoms and possible causes of an exhaust gas boiler/economiser fire. (5)

(b) Describe the procedure for inspecting and cleaning the gas side of an exhaust gas boiler/economiser. (5)

(c) Explain how the main engine and auxiliary steam plant may be operated in the event of an exhaust gas boiler/economiser suffering severe damage rendering it inoperable. (6)

2013/March						
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Q7. With reference to a main engine air starting system:

(a) explain why a slow turning system is fitted; (4)

(b) state, with reasons, when a slow turning system operates; (2)

(c) describe, with the aid of a sketch, an air starting system, explaining how the slow turning system operates. (10)

2013/March						
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Q8. (a) Describe, with the aid of a sketch, a main engine hydraulically operated exhaust valve which is designed to rotate in service. (8)

(b) Explain TWO methods how the opening of the exhaust valve described in part (a) can be controlled. (4)

(c) Explain why the valve described in part (a) is rotated. (4)

2013/March							
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Q9. (a) Explain how a diesel generator is prepared and selected as a standby generator. (8)

(b) Write a procedure for checking a diesel generator engine after it has been shut down and before it is returned to standby duty. (8)

2013/March							
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