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CINEC CAMPUS(PVT)LTD

Faculty of Marine Engineering

Department of Marine Engineering

EXAMINATION FOR CHIEF ENGINEER OFFICER ON SHIPS OF 3000KW PROPULSION POWER OR MORE

ENGINEERING KNOWLEDGE – II (Motor)

Time Allowed- Three Hours

Answer Six questions

Marks for each part of the question are shown in the brackets

2022.07.28

1. With reference to LNG carriers;
 - a) Briefly explain the dual fuel injection technology. [6 Marks]
 - b) Sketch a fuel system suitable for above engine stating the safety devices. [4 Marks]
 - c) During transportation of LNG, what is "aging" (2 Marks)
 - d) What is methane slip. (2 Marks)
 - e) What measures are taken to minimize methane slip in dual fuel engines (2 Marks)

2. a. With the aid of a block diagram describe the operation of an electronic governor for an internal combustion engine (6 Marks)
- b. State THREE problems to which such a governor is prone and explain and explain how EACH becomes evident (6 Marks)
- a. In the event of the governor on a direct drive engine becoming inoperative State the action you, as Chief Engineer, would take in order to ensure safe Operation of the engine. (4 Marks)
3. a) Explain in detail the significance of propeller curves (6 marks)
- b) Enumerate the propeller safety margins (4 Marks)
- c) Describe the procedure of estimation of effective engine power without Indicator diagrams but using:
 - i) Fuel index (3 marks)
 - ii) Turbocharger speed (3 Marks)

4. a) Explain the latest developments in Marine "Tribology" (8 Marks)
- b) Discuss the inferences you may draw from main engine lubricating oil analysis report with the proposed corrective action in each case (8 Marks)
5. Your vessel had recently been dry docked, is showing a significant increase in Fuel oil consumption. Make a report address to the Superintendent Engineer. Discuss the related inspections were made, findings and suggestions for Repair if any. (16 marks)
6. With reference to Pressure Charging Systems
- a) Discuss the different kind of Turbocharger (TC) constructions. (4 Marks)
- b) Explain how TC is matched to an engine (3 Marks)
- c) Explain how the operating performance of a TC system may be evaluated By using the available parameters. (5 Marks)
- d) With a standing instruction as a Chief Engineer to the Officer in charge of An Engineering watch to carry out routine cleaning of Turbine and Compressor sides while the engine is being operated (4 Marks)
7. a) Explain the term Torsional Vibration including the effect this can have on an engine crankshaft. (8 marks)
- b) Explain why detuner vibration damper might be fitted on an engine (4 Marks)
- c) Explain why an engine might have a barred speed range and why the engine should not be operated continuously in that range. (4 marks)
8. a) Describe with the aid of sketch an electronically controlled main engine fuel injection system. (8 Marks)
- b) Explain how the system described in part (a) functions to change the fuel injection timing when instructed by an engineer at the control terminal. (8 Marks)
9. With reference to safety valve of an exhaust gas boiler;
- a) State the formality necessary when the chief engineer sets the safety valve at sea (4 Marks)
- b) What do you mean by accumulation of pressure test, (4 Marks)
- c) Describe a method of setting a safety valve at sea (4 Marks)
- d) State the safety valve set limit in terms of %(percentage) (4 Marks)