BT MRE–VIII(R/S)–07.22–0066 Reg. No. | | | | | | | | |

C

B.Tech. Degree VIII Semester Regular/Supplementary Examination in Marine Engineering July 2022

MRE 1803 MARINE MACHINERY SYSTEM DESIGN

(*2013 Scheme*)

Time: 3 Hours Maximum Marks: 100

(5 × 20 = 100)

I. (a) What are the factors to be considered while designing marine machinery systems? (10)

(b) Explain with sketches the Lay, Waviness and Surface finish. (10)

OR

II. (a) Explain how the manufacturing process is selected from the volume of products and the melting point of the material. (10)

(b) With drawings explain how tolerances are expressed in engineering drawings. (10)

III. (a) Which material is used during manufacturing of crankshaft for a diesel engine? Which are the metallurgical processes? Which are the methods of assembling crank-shaft of a large diesel engine? (10)

(b) Which are the stresses induced in a crank web of a diesel engine crankshaft? Which are the methods of recording crankshaft alignment? (10)

OR

IV. (a) Which are the safety mechanisms on overhead crane in the engine room? Explain how the load on the crane is held in the position in the event of a power failure. (10)

(b) Sketch and describe a screw down non-return valve. Mark the parts with material. Where SDNR valve is used on board and explain why? (10)

V. (a) Sketch and describe cooling water system for a large propulsion engine. (10)

(b) Compare a Plate type cooler with tube-shell type cooler. Which arrangements are provided to allow for expansion and to minimize corrosion? (10)

OR

VI. (a) Sketch and describe thrust block for a propulsion engine. (10)

(b) Sketch and describe an auto-clean filter for fuel oil. (10)

VII. (a) (i) Sketch and describe auto sludge discharging type of purifier. (10)

(ii) Differentiate between purifier and clarifier.

(b) (i) Explain reason for using multistage compressors for higher pressures. (10)

(ii) Explain the procedure for starting of air compressor.

(iii) Which are the safety shutdowns fitted on the compressor?

OR

(P.T.O.)

VIII. (a) Sketch and describe 4-ram steering gear system of large ocean going vessel. (10)

(b) Differentiate between safety valve, relief valve, pressure reducing valve and pressure regulating valve. (10)

IX. (a) Sketch and describe air starting system for a large propulsion engine. Which are safety fittings provided to prevent explosion in starting air line? (10)

(b) Describe function of thermostatic expansion valve, back pressure valve and thermostat in a refrigeration system where temperature is maintained at minus –15°C for meat room, 4°C for dairy room and 8°C for vegetable room on board a vessel. (10)

OR

X. (a) Sketch and describe fuel oil system of large diesel engine burning intermediate fuel oil. Which are the factors which influence operation of fuel injection system? (10)

(b) Sketch and describe jerk fuel injection pump of large diesel engine. What is VIT and what is the mechanism? What are advantages of having VIT on an engine? (10)

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