

CBCS SCHEME

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18MR53

Fifth Semester B.E. Degree Examination, July/August 2022 Marine Internal Combustion Engine – I

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Draw and explain the 4-stroke timing diagram for a Marine Diesel Engine. (08 Marks)
- b. Explain the differences between a 2-stroke and 4-stroke engine. (07 Marks)
- c. Explain the difference between cross head and trunk type engines. (05 Marks)

OR

- 2 a. Describe the events which take place in the cylinders of 4 stroke and 2 stroke cycle diesel engines. (14 Marks)
- b. What do you understand by the following terms:
(i) Swept volume (ii) Clearance values (iii) Scavange efficiency (06 Marks)

Module-2

- 3 a. Why is it necessary to cool the cylinder head covers, cylinder liners and pistons of diesel engines? What is used as the cooling medium? (10 Marks)
- b. Sketch a section through the bed plate and A-frame of a large slow speed engine, identifying parts, method of construction and materials. (10 Marks)

OR

- 4 a. Sketch and explain jacket cooling system and explain the need for chemical treatment of such a system. (12 Marks)
- b. The expansion tank for a diesel engine closed cooling system is designed to maintain a constant head on the system and
(i) Reduce water temperature
(ii) Reduce water turbulence
(iii) Provide an air cushion
(iv) Allow an increase in water volume as the engine warms up
Give reasons to justify your answer. (08 Marks)

Module-3

- 5 a. Describe with the aid of sketches the loop-scavange, cross-scavange and uniflow scavange currently in use in marine engines. (10 Marks)
- b. With reference to large slow speed diesel engines discuss with reasons the following:
(i) The introduction of a long stroke cross head engine
(ii) The introduction of two-stage turbo-charging. (10 Marks)

OR

- 6 a. Describe with the aid of a sketch, a system of turbocharging of a two stroke cycle main engine. (10 Marks)
- b. Sketch and explain a constant pressure and pulse type of turbo charging system, stating its advantages and disadvantages. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42-8/50, will be treated as malpractice.

Module-4

- 7 a. How crank case explosion take place. Write the cause, prevention and indication. (10 Marks)
b. Sketch a fuel injector. Explain how it operates. (10 Marks)

OR

- 8 a. What are the main reasons for the deterioration in the quality of the fuel supplied for use in marine diesel engines? (10 Marks)
b. Give a list of properties or tests by which distilled and blended fuels may be specified or decisions made on their fitness for use. (10 Marks)

Module-5

- 9 a. Give a list of properties or tests by which a lubricating oil may be specified or a decision made on its fitness for further use. (10 Marks)
b. What are the events leading up to a crankcase explosion? (10 Marks)

OR

- 10 a. Explain the means of recognizing the deterioration of the lubricating oil. (10 Marks)
b. Describe with the aid of sketch how lubrication oil is conveyed to top end, bottom end and main bearing in large bore two stroke cross head type engines. (10 Marks)

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