C20-EE–406

7522

BOARD DIPLOMA EXAMINATION, (C-20)

NOVEMBER/DECEMBER—2022

DEEE – FOURTH SEMESTER EXAMINATION

GENERAL MECHANICAL ENGINEERING

Time : 3 hours] [*Total Marks* : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. List the types of strains.

2. Define factor of safety and ultimate stress.

3. Define torsional stiffness.

4. Explain the design of shafts based on strength criterion.

5. Write about the four stroke diesel engine.

6. Write about the magneto ignition system of petrol engines.

7. List any three elements of steam turbine.

8. List any three boiler mountings.

9. Write about hydraulic pump.

10. Write about submersible pump.

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* A steel rod of 20 mm diameter and 600 mm long is subjected to an axial pull of 40 kN. Determine the elongation of the rod if $E = 2 \times 10^5$ N/mm^2.

(OR)

(b) Draw the stress-strain diagram for mild steel and explain the terms involved in it.

12. *(a)* Derive the torsion equation with usual notations.

(OR)

(b) A solid circular shaft of 100 mm diameter is used to transmit torque. Find the maximum torque transmitted by the shaft, if the minimum shear stress induced in the shaft is 50 N/mm^2.

13. *(a)* Explain the construction and working of four stroke petrol engines.

(OR)

(b) Write in brief about the following terms related to IC engines :

(i) Spark plug

(ii) Fuel injector

(iii) Connecting rod

(iv) Cylinder head

14. *(a)* Explain the construction and working of Kaplan turbine with a neat sketch.

(OR)

(b) Explain the need of boiler accessories and describe any five of them.

15. *(a)* Explain the construction and working principle of the double acting reciprocating pump with a neat sketch.

(OR)

(b) State the priming in a centrifugal pump. Explain the purpose of priming.

PART—C

10×1=10

Instructions : (1) Answer the following question.

(2) The question carries **ten** marks.

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Explain the construction and working of De Laval impulse turbine with a neat sketch.

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