



C20-EE-406

7522

BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

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. Define the terms (a) linear strain and (b) lateral strain.
2. State Hook's law.
3. Write any three assumptions made in deriving the Torsion equation.
4. State the functions of shaft.
5. State any three differences between Two-Stroke and Four-Stroke engines.
6. State the functions of (a) piston rings and (b) cylinder.
7. State the functions of (a) economizer and (b) pressure gauge.
8. State any three differences between fire tube and water tube boilers.
9. Write the classification of pumps.
10. State any three differences between reciprocating pump and centrifugal pump.

PART—B

8×5=40

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **eight** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** (a) Draw the stress-strain curve for ductile material and explain all the salient points on it.

(OR)

- (b) A mild steel bar has a diameter of 30 mm and is 500 mm long is subjected to a tensile load of 60 kN is applied longitudinally. Calculate the elongation of the bar and change in volume, take $E = 2 \times 10^5 \text{ N/mm}^2$ and Poisson's ratio as 0.3.

- 12.** (a) Derive the Torsion equation.

(OR)

- (b) A shaft is subject to a torque of 20 kN-m. Find the necessary diameter of the shaft, if permissible shear stress is not to exceed 60 N/mm^2 and allowable twist is 1° in a length of 3 m, take $G = 8 \times 10^4 \text{ N/mm}^2$.

- 13.** (a) With the help of a neat sketch, explain the working of Four-Stroke diesel engine.

(OR)

- (b) Explain the working of Two-Stroke petrol engine with a neat sketch.

- 14.** (a) Describe with a neat sketch, the working of Pelton wheel.

(OR)

- (b) Sketch and explain the working of Lamont high pressure boiler.

- 15.** (a) With the help of a neat sketch, explain the working of jet pump.

(OR)

- (b) Explain the working of double acting reciprocating pump with a neat sketch.

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.** What is meant by priming in a centrifugal pump? Explain the working of single-stage centrifugal pump with a neat sketch.

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