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C23-EE-405

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BOARD DIPLOMA EXAMINATION, (C-23)

MARCH/APRIL—2025

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)* tensile stress and *(b)* compressive stress.

2. Draw stress-strain diagram for a ductile material and show salient points in it.

3. What is a 'Shaft' and how are they classified.

4. Write the formula for the polar moment of inertia of

(a) a circular solid shaft of diameter 'd'

(b) a hollow shaft of internal diameter 'd_i' and external diameter 'd_0'.

5. Compare four-stroke and two-stroke IC engines.

6. List out any six components of IC engine.

7. Compare fire tube and water tube boilers.

8. State the working principle of a steam turbine.

9. What is priming in a centrifugal pump?

10. What are the applications of a reciprocating pump?

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

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

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

11. A load of 150 kN was applied over a specimen of 20 mm diameter and 150 mm length in a compression testing machine. The reduction in length due to compressive force was 0·2 mm. Determine the Young's modulus of elasticity.

12. Calculate the power transmitted by a shaft of 200 mm diameter running at 300 rpm, if the shear stress in the shaft is not to exceed 75 N/mm^2.

13. Explain the working principle of a 4-stroke diesel engine with a neat sketch.

14. Compare petrol and diesel engines.

15. Explain the working of a 'Lamont boiler' with a neat sketch.

16. Explain the working of Francis turbine with a neat sketch.

17. Draw a neat sketch of a centrifugal pump and explain its working.

18. How a single acting reciprocating pump works? Explain with the help of a neat sketch.

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