



C14-EE-306

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BOARD DIPLOMA EXAMINATION, (C-14)  
MARCH/APRIL—2016  
DEEE—THIRD 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 Poisson's ratio and write its units.
2. A rod of 20 mm diameter of length 1.5 m is subjected to an axial pull of 40 kN. Taking  $E = 10^5 \text{N/mm}^2$ , calculate the stress and strain.
3. Define the terms torsional rigidity and torsional stiffness.
4. State the functions of shaft.
5. Write the classification of IC engines.
6. State any three differences between 2-stroke and 4-stroke engines.
7. List out the boiler mountings.
8. Write the working principle of steam turbine.
9. List out the properties of lubricant.
10. Write the classification of multistage centrifugal pump.

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**PART—B**

10×5=50

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

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

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

- 11.** Draw the stress-strain diagram for mild steel and explain the salient points of it.
- 12.** A mild steel bar has a diameter of 40 mm and is 500 mm long. A tensile load of 70 kN is applied longitudinally. Calculate the elongation of the bar, the change in diameter and the change in volume. Take,  $E = 2 \times 10^5 \text{N/mm}^2$  and Poisson's ratio as 0.3.
- 13.** A solid shaft of 120 mm diameter transmits 80 kW power at 160 r.p.m. Taking modulus of rigidity as  $0.85 \times 10^5 \text{N/mm}^2$ , determine—
- (a) torque on the shaft;
  - (b) maximum shear stress induced;
  - (c) angle of twist in a length of 800 mm;
  - (d) shear stress at a radius of 36 mm.
- 14.** Explain the working of a simple carburetor with a neat sketch.
- 15.** Draw the line sketches of 4-stroke diesel engine and explain its working principle.
- 16.** Describe the Babcock and Wilcox boilers with neat sketch.
- 17.** Explain the working principle of reaction turbine with neat sketch.
- 18.** Draw a simple sketch showing the installation of a centrifugal pump and explain the working.

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