



C16-EE-304

6240

BOARD DIPLOMA EXAMINATION, (C-16)

JANUARY/FEBRUARY—2022

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 Hook's law and Poisson's ratio.
2. Define (a) working stress and (b) ultimate stress.
3. Write the formula for polar moment of inertia for solid shaft and name the quantities present in it.
4. Write the classification of shafts.
5. List any five classifications of internal combustion engines.
6. Write any three differences between fire tube boiler and water tube boiler.
7. Write the functions of (a) Carburettor and (b) Governor.
8. Write the differences between mounting and accessories of a boiler.
9. Write the classification of hydraulic turbines.
10. Write any three differences between centrifugal pump and reciprocating pump.

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## PART—B

10×5=50

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

- 11.** A bar of 300 mm long is 50 mm diameter for 120 mm of its length, 30 mm diameter for the next 100 mm length and 40 mm diameter for the remaining length. It is subjected to a tensile load of 100 kN. Calculate the stress induced in each cross section of the bar and total elongation of the bar. Take  $E = 2 \times 10^5 \text{ N/mm}^2$ .
- 12.** A hollow shaft is required to transmit 400 kW at 240 rpm. The maximum torque is 20% greater than mean. The permissible shear stress is  $60 \text{ N/mm}^2$ . The twist in a length of 4 m is not to exceed  $15^\circ$ . The ratio between inner and outer diameter is  $2/3$ . Calculate inner and outer diameters of the shaft. Take  $G = 80 \text{ K kN/mm}^2$ .
- 13.** Explain the working of four-stroke diesel engine with neat sketch.
- 14.** Describe the working of fuel injection pump with neat sketch.
- 15.** Describe the working of high pressure boiler with neat sketch.
- 16.** Explain the construction and working of Parson's reaction turbine.
- 17.** Explain the working of submersible pump with neat sketch.
- 18.** Describe the working of Pelton wheel with neat sketch.

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