



C14-EE-306

4248

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2018
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. List out the three elastic constants and write down the relation between them.

2. A rod of 20 mm diameter of length 1.5 m is subjected to an axial pull of 40 kN. If $E = 1 \times 10^5 \text{ N/mm}^2$, calculate the stress and strain.

3. Define (a) torsion and (b) torsional rigidity.

4. A solid shaft 80 mm diameter transmits 100 kW at 150 r.p.m. Find the torque transmitted by the shaft.

5. What are the operations in an internal-combustion engine?

6. What are the functions of governor?

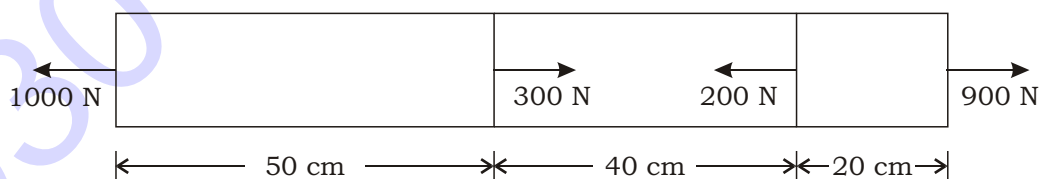
- * 7. Differentiate between fire-tube and water-tube boilers.
- 8. How will you classify steam turbines?
- 9. What is priming?
- 10. Write the advantages and disadvantages of antifriction bearings.

PART—B

10×5=50

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

- 11. A cylindrical bar is of 25 mm diameter and 1.25 m long. The linear strain is 4 times the lateral strain. Calculate the shear modulus, bulk modulus and change in volume, if the bar is elongated by 0.06 mm under an axial load of 50 kN.
- 12. A steel bar 25 mm diameter is loaded as shown in the figure. Determine the stresses in each part of total elongation. Take $E = 210 \times 10^9 \text{ N/m}^2$.



- * 13. Determine the diameter of solid shaft to transmit 450 kW of power at 100 r.p.m. The maximum torque is 15% greater than the mean torque. The allowable shear stress should not exceed 65 N/mm^2 and angle of twist in 3 m should not exceed 1° .
- 14. Explain the working principle of 2-stroke petrol engine.

- * **15.** Describe the working of fuel injection pump with a neat sketch.
- 16.** Explain the construction and working of Lancashire boiler along with sketch.
- 17.** Explain the construction and working of Parson's reaction turbine.
- 18.** Explain pedestal bearing and bushed bearing with a neat sketch.

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