



C14-EE-306

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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?

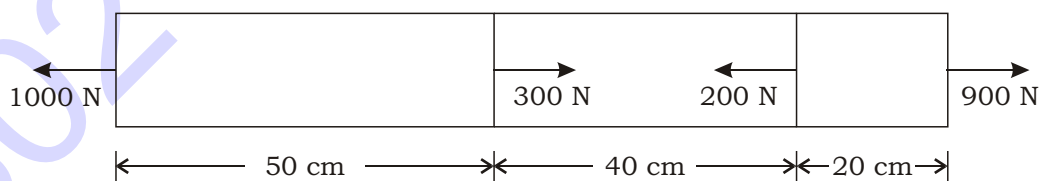
7. Differentiate between fire-tube and water-tube boilers.
8. How will you classify steam turbines?
9. What is priming?
10. Write the advantages and disadvantages of antifriction bearings.

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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