TED (15/19) - 4021
(REVISION-2015/19)

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Reg.No………………
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2024

APPLIED MECHANICS & STRENGTH OF MATERIALS

(Maximum Marks:100)   (Time: 3 Hours)

PART - A
(Maximum Mark : 10)

Marks

I.   Answer **all** the questions in one or two sentences. Each question carries 2 marks.

1. State Hook's law.

2. Define modulus of rigidity.

3. Define friction.

4. Define polar moment of inertia.

5. List the types of springs.   (5 x 2 = 10)

PART - B
(Maximum Mark: 30)

II   Answer **any five** questions from the following. Each question carries 6 marks.

1. Draw stress strain diagram for mild steel under tension and identify the significant points.

2. Explain elastic limit, ultimate stress and working stress.

3. Explain sliding friction, rolling friction and pivot friction.

4. List the different types of riveted joints.

5. Define rivet value, strength and efficiency of riveted joints.

6. Explain the reasons for failure of thin cylindrical shell due to an internal pressure.

7. Define shear force and bending moment.

(5 x 6 = 30)

*P.T.O*

PART – C
(Maximum Mark: 60)
(Answer *one full* question from each unit. Each full question carries 15 marks.)

UNIT - I

III   a) Explain tensile stress, compressive stress and shear stress.   (6)

        b) Find the minimum diameter of a steel wire, which is used to raise a load
            of 4000 N if the stress in the rod is not to exceed 95 MN/m^2.   (9)

OR

IV   a) Define volumetric strain and bulk modulus.   (6)

        b) A brass bar having cross sectional area of 1000 mm^2 is subjected to axial
            forces as in figure. Find the total elongation if E = 1.05 x 10^{5}N/mm^2.   (9)
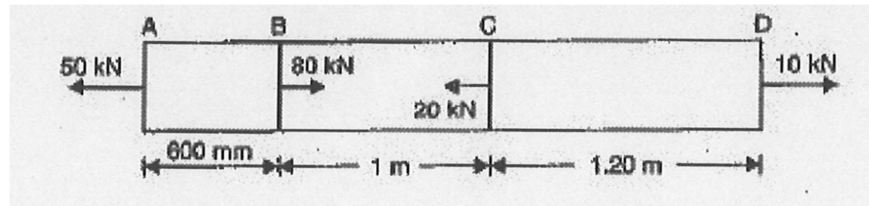
UNIT – II

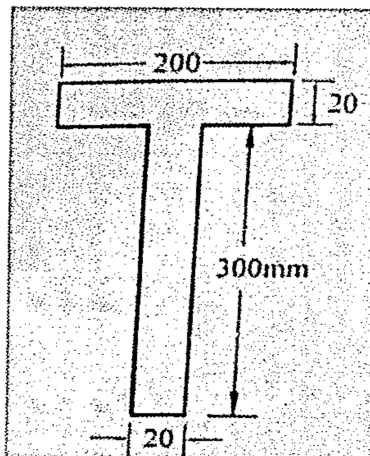V   a) State the laws of frictions.   (6)

        b) State and prove parallel axis theorem.   (9)

OR

VI   a) Differentiate centroid and centre of gravity.   (6)

        b) Locate the centroid of the T section indicated in the figure.   (9)

UNIT – III

VII   a) With the help of a neat diagram explain the chain riveted joint-and zig-zag riveted joint.   (6)

  b) Two plates 8mm thick are joined by a single riveted lap joint. The diameter of the rivets are 16mm and pitch 50 mm. If σ_t = 120 N/mm^2, τ = 90 N/mm^2 and σ_c is 160 N/mm^2.   Determine the efficiency of joint.   (9)

OR

VIII   a) Which are the assumptions considered for deriving torsion equation in shafts? (6)

  b) The shearing stress in a solid shaft is not to exceed 40 N/mm^2 when the torque transmitted is 20000 N-m. Determine the minimum diameter of the shaft.   (9)

UNIT – IV

IX   a) Explain SFD and BMD.   (6)

  b) Derive the equation for simple bending.   (9)

OR

X   a) With schematic diagram explain different types of loads.   (6)

  b) The external and internal diameter of a hollow cast iron column are 5 cm and 4 cm. If the length of this column is 3m and both of its ends are fixed. Determine crippling load using Rankine's formulae. σ_c =550N/mm^2, α =1/1600.   (9)

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