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09ENG2.5

Second Semester B.Arch. Degree Examination, June/July 2015
Structures - II

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions.***
2. ***Missing data, if any may be assumed suitably.***

1 a. Define the terms : i) Stress ii) Strain iii) Factor of safety. **(06 Marks)**

b. A rod of 1500mm long and diameter 20mm is subjected to an axial pull of 20×10^3N. If the modulus of elasticity of the material of the rod is 2×10^5 N/mm^2. Determine i) Stress ii) Strain iii) Elongation of the rod. **(14 Marks)**

2 a. Draw the typical Stress – Strain curve for mild steel and explain the salient points. **(06 Marks)**

b. Find the Young's modulus of a brass rod of diameter 25mm and length 250mm, which is subjected to a tensile load of 50kN, when the extension of the rod is 0.30mm. **(14 Marks)**

3 a. Define i) Young's modulus ii) Modulus of rigidity iii) Bulk modulus iv) Poisson's ratio. **(06 Marks)**

b. A bar is subjected to an axial tensile load of 60kN, shown in fig. Q3(b). Calculate total elongation if E = 1.5×10^5N/mm^2. Also calculate the stresses in AB, BC and CD portions. **(14 Marks)**

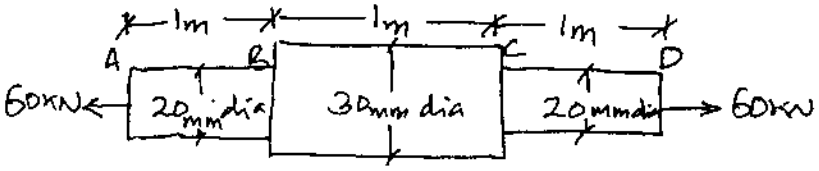


Fig.Q3(b)

4 a. Derive an expression for [E = 3K – 6 kμ] with usual notations. **(06 Marks)**

b. Determine the value of Young's modulus and Poisson's ratio of a metallic bar of length 300mm, breath 40mm, and depth of 40mm. When the bar is subjected to an Axial compressive load of 400kN. The decrease in length of the bar is given as 00.75mm and increase in breadth as 0.03mm. **(14 Marks)**

5 a. Draw SFD and BMD for the beam shown in fig. Q5(a). **(10 Marks)**

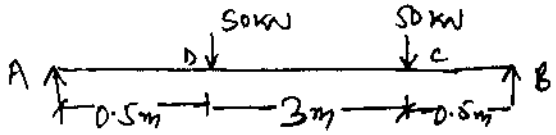


Fig.Q5(a)

b. Draw SFD and BMD for the beam shown in fig. Q5(b). **(10 Marks)**

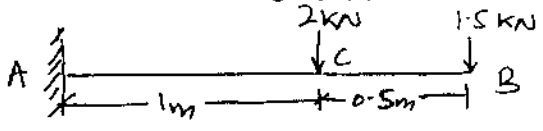
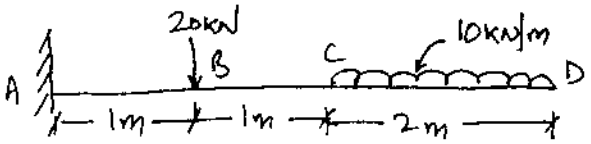


Fig.Q5(b)

6 Draw SFD and BMD for the beam shown in fig. Q6. **(20 Marks)**

Fig.Q6



7 a. Define section modulus and moment of resistance with usual notations. **(06 Marks)**

b. A 2m long of rectangular section 50mm × 100mm is simply supported on its ends and is subjected to a point load of 10kN at its mid span. Draw the sketch showing bending stress distribution along the depth of the section under maximum bending moment. **(14 Marks)**

8 Write short notes on the following :

a. Lateral strain and longitudinal strain.

b. Relationship between load, shear force and bsending moment.

c. Shear stress distribution for any five different sections.

d. Assumptions in theory of pure bending. **(20 Marks)**

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