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Total No. of Questions: 8

B. Architecture (Semester – 2nd)
STRUCTURE DESIGN-I
Subject Code: BARC1-214
Paper ID: 120113

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Attempt any FIVE questions. All questions carry equal marks.

Q1. (a) Draw the Stress-Strain diagram of Steel indicating salient points.
(b) A simply supported beam of span 5 m is subjected to uniformly distributed load of 10kN/m throughout the span. Calculate the maximum bending stress. (4+8)

Q2. A steel rod 20 mm in diameter, 400mm long is coaxially enclosed in a brass tube of 25 mm external diameter and 2 mm thickness with 400 mm length. Determine the stress induced in each material and change in length of the assembly, if it is subjected to an axial force of 50 kN. Take E_s=200 GPa, E_b=100GPa. (12)

Q3. A beam is simply supported having span 3m. It is subjected to a uniformly distributed load of 2 kN/m throughout the span. Determine maximum bending moment. Draw SFD and BMD. (12)

Q4. A cantilever beam of 2 m length is subjected to a point load of 2 kN at the free end. There is another point load of 2 kN at 1 m from the fixed support. Determine Shear Force and Bending Moment at 1m from the free end? Draw SFD and BMD. (12)

Q5. Design a rectangular RCC column of size 450 mm x 600 mm to carry an axial load of 1200 kN using lateral ties. The column is 3 m long with both of its ends hinged. Use M20 concrete and Fe415 steel. (12)

Q6. Define the following
(a) Slenderness ration (b) Shape factor (c) Load factor (12)

Q7. A masonry retaining wall of 5 m high is 1.5 m wide at the top, 3 m wide at the base. It retains soil level with the top. The density of soil is 18 kN/m^3 and density of masonry is 20 kN/m^3. Check the stability of the wall. (12)

Q8. Discuss the different types of loads, you will consider for Designing foundations. (12)