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BAR-044

00149

BACHELOR OF ARCHITECTURE

Term-End Examination

December, 2011

BAR-044 : THEORY OF STRUCTURES-V

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any four** questions. **All** questions carry **equal** marks. Use of Scientific Calculator and IS : 456 code is **permitted**.*

1. Determine the moment of resistance of a reinforced concrete beam having a rectangular cross-section 300mm wide and 500mm deep, reinforced with 5ϕ20 as tensile reinforcement. The characteristic strength of concrete is 15 MPa and that for steel is 250 MPa. **17½**

2. A simply supported rectangular reinforced concrete beam of 6m effective span has a cross - section of 300×630mm and loaded with 80kN/m UDL excluding its self weight. Determine reinforcement of the beam taking M 15 concrete and Fe 415 steel. **17½**

3. Determine the shear reinforcement for a beam having cross-section $b \times D = 250 \times 500$ and reinforced with 4ϕ20. The factored shear force is 130kN. Use M15 concrete and Fe 250 steel. Provide vertical stirrups only as shear reinforcement. **17½**

4. Design the reinforcement in a column of size 450mm × 600mm, subjected to an axial load of 2000kN under service dead and live loads. The column has an unsupported length of 3m and is braced against sideways in both directions. Use M 20 concrete and Fe 415 steel. **17½**

5. Design a square footing for a superimposed load of 800kN. The safe bearing capacity for soil is 200kN/m^2. Use M20 concrete and Fe 250 steel. Size of column is 500 × 500. Take nominal cover as 50mm. **17½**

6. (a) Define one-way and two-way slabs. Explain clearly the difference in the behaviour of one-way and two-way slabs. **6**

   (b) Sketch the plan and section showing detailing of reinforcement of a two-way simply supported slab. **6**

   (c) Define development length. What is its significance ? **5½**

7. (a) What is diagonal tension ? Discuss its effects and methods of resisting it. **7½**

   (b) Discuss the principles of making structures earthquake resistant. **10**