IH Used Paper BTECH-Oct-11-20

Code No: 135AJ **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, October - 2020
DESIGN OF REINFORCED CONCRETE STRUCTURES
(Common to CE, CEE)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1. Design the reinforcement of a concrete beam section subjected to a moment of 250 kNm. The overall size of the section is limited to 300 mm × 450 mm. Use M 25 concrete and Fe 415 steel reinforcement. Adopt limit state method of design. [15]

2. Explain about stress block parameters. [15]

3. A simply supported RC beam of section 300 mm × 500 mm (effective depth) is subjected to an ultimate shear force of 150 kN at the supports. The beam is reinforced with 4 bars of 20 mm diameter. Design the shear reinforcement. Sketch the shear reinforcement details. Use M 20 concrete and Fe 415 steel. [15]

4. A rectangular reinforced concrete beam of size 300 mm × 600 mm overall depth is subjected to an ultimate moment of 75 kNm, a factored shear force of 90 kN and a factored torsional moment of 25 kNm. Design the longitudinal and transverse reinforcement. Sketch the reinforcement details. Use M 20 concrete and Fe 415 steel. [15]

5. Design a reinforced concrete column of effective length 3.6 m subjected to a factored axial load of 1250 kN and factored moments of 160 kNm and 125 kNm with respect to the major and minor centroidal axes respectively. Use M 25 grade concrete and Fe 415 steel. [15]

6. Design the reinforcement of an RCC column of size 300 mm × 350 mm subjected to a factored axial load of 1200 kN and factored moments of 40 kNm and 25 kNm with respect to the major and minor centroidal axes respectively at the top. The moments at the bottom end equal to 60 % of the corresponding values at the top. Assume the column is bent in double curvature and the effective length of the column is 6.0 m. Use M 25 grade concrete and Fe 415 steel. [15]

7. Design the footing for a rectangular column 300 mm × 450 mm subjected to an axial load of 900 kN. Assume the bearing capacity of soil is 180 kN/m^2. Use M 20 concrete and Fe 415 steel. [15]

8. Design an RCC two-way slab of clear dimensions 4.5 m × 6 m with two adjacent edges continuous. The slab is subjected to live load of 3 kN/m^2 and floor finish of 1 kN/m^2. Assume the width of the supports is 300 mm. Use M 20 grade concrete and Fe 415 steel. Sketch the reinforcement details. [15]

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