

Code: 13A01502

R13

B.Tech III Year I Semester (R13) Supplementary Examinations June 2016

**DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES**

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Use of IS 456:2000, SP16 Design aided charts only and IS: 875 (Part 1 & Part 2) books are permitted in the examination hall.

**PART – A**

(Answer any one question: 01 X 28 = 28 Marks)

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- 1 Design a reinforced concrete slab for a room of clear dimensions 4 m × 5 m. The slab is supported on walls of width 300 mm. The slab is carrying a live load of 4 kN/m<sup>2</sup> and floor finishes 1 kN/m<sup>2</sup>. The corners of slab are held down. Use M20 & Fe415 steel. Draw plan and cross sectional details.
- 2 Design a rectangular footing of uniform thickness for an axially loaded column of size 300 mm × 600 mm load on column is 1150 kN. Safe bearing capacity of the soil is 200 kN/m<sup>2</sup>. Use M20 & Fe415 steel. Draw plan and cross sectional details.

**PART – B**

(Answer any three questions: 03 X 14 = 42 Marks)

- 3 Design a rectangular beam 230 mm × 600 mm over an effective span of 5 m. The super imposed load on the beam is 50 kN/m. Use cover as 50 mm. Adopt M20 concrete & Fe415 steel.
- 4 Determine the limiting moment of resistance and limiting area of steel for a reinforced concrete T – beam having flange width of 1600 mm, effective depth 350 mm and thickness of flange is 100 mm. Width of web is 250 mm. Use M20 concrete & Fe500 steel.
- 5 A simply supported R.C.C beam 250 mm wide and 450 mm effective depth is reinforced with 4-18 mm diameter bars. Design the shear reinforcement if M<sub>20</sub> grade of concrete and Fe415 steel is used and beam is subjected to a shear force of 150 kN at service state.
- 6 A column of size 300 mm × 400 mm has effective length of 3.6 m and is subjected to P<sub>u</sub> = 1100 kN and M<sub>u</sub> = 150 kN/m about the major axis. Design the column using M25 concrete and Fe415 steel.
- 7 A straight stair in a residential building is supported on wall at one side and by stringer beam on the other side, with a horizontal span of 1.2 m. The rises are 150 mm and tread 300 mm. Design the steps. Use M20 & Fe415 steel. Take live load as 3 kN/m<sup>2</sup>.

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