Code: 13A01502

R13

B.Tech III Year I Semester (R13) Regular Examinations December 2015
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 and draw reinforcement detailing of an L- beam for an office floor to suit the following data:
Clear span = 8 m
Thickness of flange = 150 mm
Live load = 4 kN/m^2
Spacing of beams   = 3 m
Adopt M-20 grad concrete and Fe – 415 HYSD bars

2   Design and draw a reinforcement details of a combined footing for two reinforced concrete columns using the following data:
Size of column = 300 mm by 300 mm
Spacing of column = 4 m
Load transmitted by each column = 500 kN
SBC of soil = 150 MPa and adopt M20 grade concrete and Fe – 415 grade steel.

PART – B
(Answer three questions: 03 X 14 = 42 Marks)

3   Design a reinforced concrete beam of rectangular section using the following data:
Effective span = 5 m
Width of the beam = 250 mm
Overall depth = 500 mm
Service load (DL+LL) = 40 kN/m and effective cover = 50 mm.
Adopt M-20 grad concrete and Fe – 415 HYSD bars.

4   Design a rectangular slab 5 m by 4 m in size and simply supported at the edges to support a service load of 4 kN/m^2. Assume coefficient of orthotropy (μ) as 0.7. Adopt M-20 grade concrete and Fe-415 HYSD bars.

5   Design the reinforcements in a circular column of diameter 300 mm to support a service axial load of 800 kN. The column has unsupported length of 3 m and is braced against side sway. The column is reinforced with helical ties. Adopt M-20 grade concrete and Fe-415 HYSD steel.

6   Design a reinforced concrete footing for a rectangular column of section 300 mm by 500 mm supporting an axial factored load of 1500 kN. The safe bearing capacity of the soil is 185 kN/mm^2. Adopt M-20 grade concrete and Fe-415 steel HYSD bars.

7   Design one of the flights of dog-legged stairs spanning between landing beams using the following data: Number of steps in the flight = 10,   Tread (T) = 300 mm, rise (R) = 150 mm
Width of landing beams = 300 mm,   M-20 grade concrete and Fe-415 HYSD bars.
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