Code No: **R31011** **R10** **Set No. 1**

III B.Tech I Semester Supplementary Examinations, May - 2016

DESIGN AND DRAWING OF CONCRETE STRUCTURES

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any ONE question from PART-A
and THREE questions from PART-B
Use of IS: 456-2000 and design charts from SP-16 is allowed.

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PART-A

1 An interior room of a building has internal dimensions of 6 × 4m. Design the floor to support a live load of 3.0 KN/m^2 and surface finish of 1.5 KN/m^2. Consider concrete of grade M20 and HYSD steel of grade Fe415 subjected to mild environmental exposure. The thickness of brick masonry walls is 230 mm. Draw reinforcement details. [30]

(OR)

2 Design a rectangular isolated sloped footing for a column of size 300 × 750 mm carrying an axial service load of 1800KN. The safe bearing capacity of the soil at the site is 200kN/m^2. The construction materials stipulated are: M20 grade concrete mix and HYSD steel of grade Fe 415. Draw reinforcement details. [30]

PART-B

3 a) Explain the term Characteristic strength and characteristic loads. [8]

b) Briefly explain the reasons for the development of diagonal tension cracks in R.C. beams. [7]

4 A singly reinforced concrete beam has a width 300mm and overall depth 550 mm with a clear cover of 40mm is reinforced with 4 bars of 20 mm diameter. Find the flexural strength and hence the safe u.d.l on the simply supported beam of span 5m. Use M20 concrete and Fe 415 steel. [15]

5 Design a R.C. Circular column section to carry a factored load of 2500kN. Provide helical reinforcement as transverse reinforcement. Adopt M20 concrete and Fe-415 steel. [15]

6 A cantilever beam of span 3 m has a cross section of 250 mm × 500 mm. It is reinforced with 4 bars of 20 mm diameter on tension side and 2 bars of 20mm on compression side, with effective cover of 50 mm on both sides. Determine the deflection at free end, if it is subjected to a total service load (including self weight) of 35kN/m. Grades of concrete and steel used M20 and Fe 415. [15]

7 A rectangular section of effective size 300 mm × 500mm is used as a simply supported beam for effective span 7m. What maximum u.d.l can be allowed on the beam, if the maximum percentage of steel is provided, only on tension side? Use M20 concrete Fe 415 steel. Determine the amount of steel to be provided. [15]

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