

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

III B.Tech I Semester Supplementary Examinations, Nov - 2015
DESIGN & 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.

PART-A

- 1 The floor slab of a room with internal dimensions of 5.5×4.0 m is to carry a live load of 2.5 kN/m^2 and dead load due to flooring, finishing and partitions of 1.5 kN/m^2 . Design the slab if it is simply supported on all four edges when corners are free to lift, Use M20 grade concrete mix and HYSD steel of grade Fe415. Draw reinforcement details. [30]

(OR)

- 2 Design a square isolated footing of uniform thickness for a reinforced concrete square column of size 500 mm transmitting an axial service load of 2800kN. The safe bearing capacity of the soil at the site is 160 kN/m^2 , and the materials to be used are M20 grade concrete and HYSD steel of grade Fe415. Draw reinforcement details. [30]

PART-B

- 3 a) How limit state method differs from ultimate load method? [8]
 b) Sketch the various types of shear reinforcement normally provided in practice. [7]
- 4 A rectangular beam is 200mm wide and 500mm deep. It is reinforced with 4 bars of 25mm diameter in compression with an effective cover of 50mm. Determine the area of tension reinforcement needed to make the beam section fully effective. What would be the moment of resistance? Use M20 concrete and Fe 415 steel. [15]
- 5 Design a short column 450 mm square in section to carry an axial load of 850kN with moments of 60 kNm and 40 kNm about two axes at working loads. Assume M20 concrete and Fe-415 steel. Use of SP – 16 permitted. [15]
- 6 A rectangular simply supported beam of span 5m is 300mm×650mm in cross section and is reinforced with 3 bars of 20mm on tension side at an effective cover of 50mm. Determine the short term deflection due to an imposed working load of 25kN/m (excluding self wt). Assume grade of concrete M20 and grade of steel as Fe 415. [15]
- 7 A 250 mm wide and 600 mm deep R.C. beam is reinforced with 2 legged 10mm inclined stirrups at 250 mm c/c with $\alpha = 60^\circ$. Longitudinal steel consists of 4 bars of 20 mm with a cover of 40 mm. If concrete grade is M20 and grade of steel is Fe 415, determine the strength of the section in shear. [15]

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