Code: 13A01502

R13

B.Tech III Year I Semester (R13) Regular & Supplementary Examinations November/December 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 is permitted in the examination hall.

PART – A

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

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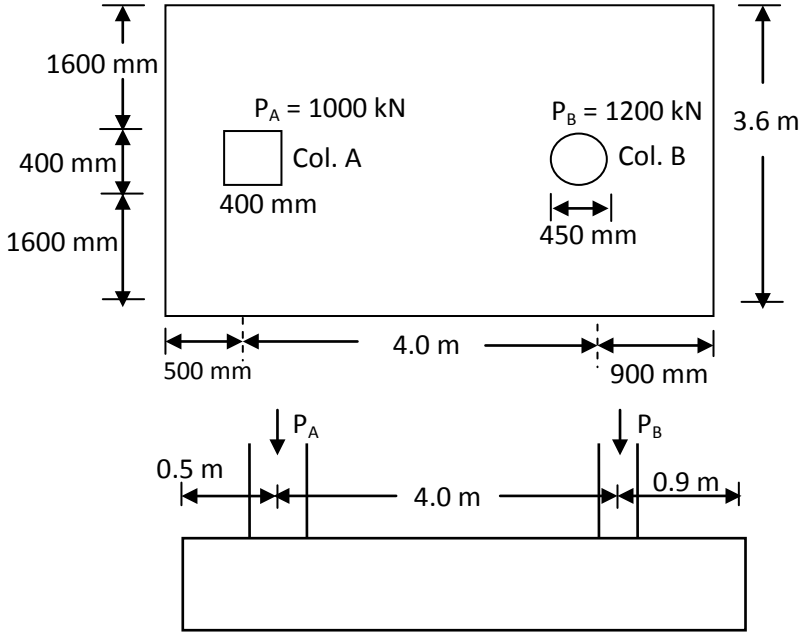
1 Design an inverted T-beam roof for a hall 6.0 m wide and 15 m long to support a dead load of intensity 2.5 kN/m^2 and a live load of intensity 1.5 kN/m^2. Use M_{20} grade concrete and Fe415 steel.

(a) Draw cross-section of roof slab along with reinforcement details

(b) Draw cross-section and longitudinal section of inverted T-beam

2 Design a combined footing for two interior columns carrying axial loads 1000 kN and 1200 kN. Column A is 40 cm x 40 cm is size and column B is 45 cm in diameter. They are reinforced with 20 mm bars, are spaced at 4.0 m c/c as shown in figure. The bearing capacity of the soil is 120 kN/m^2 use M_{20} mix and Fe415 grade steel. Draw cross section of combined footing with reinforcement details.



PART – B

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

3 Design a rectangular beam for an effective span of 6.0 m. The superimposed load is 80 kN/m and size of the beam is limited to 30 cm x 70 cm over all. Use M_{20} mix and Fe415 grade steel.

4 (a) Explain the primary and secondary torsion.

(b) Explain the codal provisions to estimate deflection and cracking.

5 Design a two-way slab for a room 5.5 m x 4.0 m clear in size, if the superimposed load is 5 kN/m^2. Take f_{ck} and f_y as 20 N/mm^2 and 415 N/mm^2.

6 Design a short column, square in section, to carry an annual load of 2000 kN. Using: (i) Mild steel. (ii) Fe415 grade and M_{20} mix.

7 Explain the different types of stair cases and what do you understand by spanning horizontal and spanning longitudinally. [Provide IS456-2000 code provisions]

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