

III B. TECH I SEMESTER REGULAR EXAMINATIONS, FEB-2022
DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES
(Civil Engineering)

Time: 3 Hours

Max. Marks: 60

Answer any **ONE** Question from Part – A (24Marks) & any **THREE** Questions from
 Part – B (3*12 =36Marks)

Use of IS: 456-2000 and design charts from SP-16 are allowed.

Data not given/found, necessary may be assumed suitably.

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**PART- A (1\*24 = 24 Marks)**

1. Design a continuous R.C. slab for a hall 6m wide and 9m long. The slab is supported on R.C. beams spaced at 3m intervals. The rib width of the beams is to be taken as 230mm. The superimposed load is 4kN/m<sup>2</sup> and floor finish is 1kN/m<sup>2</sup>. Use M20 grade concrete and Fe415 grade steel. Also sketch the plan and section of slab with reinforcement details. [24M]

(OR)

2. A rectangular R.C column 300mm x 450mm carries an axial working load of 900kN. The safe bearing capacity of the soil is 130kN/m<sup>2</sup>. Design a rectangular footing of uniform thickness assuming M20 grade concrete and Fe415 steel. Draw the plan and section of the footing with reinforcement details. [24M]

**PART- B (3\*12 = 36 Marks)**

3. a) Distinguish briefly between “Working stress method” and “Limit state method” [6M]  
 b) Show that the limiting depth of neutral axis for a rectangular cross section, reinforced with Fe415 grade steel, is 0.48d [6M]
4. A singly reinforced rectangular beam of 5m span is simply supported and carries working loads of dead load 18kN/m and live load 12kN/m in addition to its self weight. Design the beam section of 23cm rib width for flexure at its mid span. Assume M20 grade concrete and Fe415 grade steel. [12M]
5. An interior panel of a slab measures 4.5m x 6.0m centre to centre of supporting beams of 230mm width. Live load as 4kN/m<sup>2</sup> and floor finish as 1kN/m<sup>2</sup> may be assumed. Design the slab using M20 grade concrete and Fe415 grade steel. [12M]
6. A short column of size 300mm x 600mm is subjected to an axial factored load of 960kN and factored moment of 300kN-m about its major axis. Determine the reinforcement to be provided in the column, if the moment due to minimum eccentricity is less than the applied moment. The materials are M20 grade concrete and Fe415 grade steel. [12M]
7. A square column 400mm x 400mm in cross-section carries an axial load 1200kN. Design the square isolated footing for the column. The safe bearing capacity of the soil is 120kN/m<sup>2</sup>. Use M20 grade concrete and Fe415 steel. [12M]

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