

Code No: **R31011**

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, May - 2019
DESIGN & DRAWING OF CONCRETE STRUCTURES
(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any ONE questions Part-A (1 x 30 Marks)
And THREE question from Part-B (15x3= 45 Marks)
Use of IS: 456-2000 and design charts from SP-16 is allowed.

PART-A

- 1 A simply supported R.C.C. beam over an effective span of 8 m carrying an imposed load of 30 kN/m. Design the beam using M20 grade concrete and Fe 415 steel. Sketch the details of reinforcement [30M]

(OR)

- 2 Design an R.C.C. slab of size 5 m x 6 m, simply supported on all four edges with corners held down. The slab is carrying a load of 4 kN/m² including floor finish etc. Use M 20 concrete and Fe 415 steel. Sketch the details of reinforcement also. [30M]

PART-B

- 3 Draw stress block diagram and evaluate the following expressions for limit state design: [5M]
a) Neutral Axis depth [4M]
b) Lever arm [6M]
c) Moment of resistan
- 4 A simply supported beam with clear span 6 m, width 400 mm and effective depth 560 mm carries a limit state load of 175 kN/m inclusive of self weight, dead load and live load. It is reinforced with 4 bars of 28 mm diameter tension steel which continue right into the support. Take $f_{ck} = 20 \text{ N/mm}^2$, $f_y = 250 \text{ N/mm}^2$, Design shear reinforcement. [15M]
- 5 An R.C.C. short column of size 400 mm x 500 mm is carrying a factored load of 3000 kN. Design the column assuming $e_{min} < 0.05 D$. Use M25 concrete and Fe 415 steel. [15M]
- 6 Design an isolated rectangular footing for an axial load of 1500 kN transmitted by the column. The cross section of the column is 230 mm x 450 mm. The SBC of soil is 180 kN/m². Adopt M20 grade concrete and Fe 415 grade steel. [15M]
- 7 Design a single flight stair case slab to cover a horizontal span of 4.5 m if the total vertical rise is 3.6 m. There are total 18 steps to rise. The tread is 250 mm. Take live load as 3000 N/m². Use M25 concrete and Fe 415 steel. [15M]
