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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

B.Tech III Year I Semester Supplementary Examinations November-2020
DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES
(CIVIL ENGINEERING)

Time: 3 hours

Max.Marks: 60

(USE IS 456-2000 and SP-16 CHARTS)

PART-A**Answer any one question.****1X 24 = 24 Marks**

- 1 Design a slab over a room 4 m x 6 m as per IS code. The edge of the slab is simply supported and the corners are not held down. The live load on the slab is 3 kN/m^2 . The slab has a bearing of 150 mm on supporting walls. Use M20 concrete and Fe415.

OR

- 2 Design an isolated footing for a column of size 500 mm × 500 mm subjected to an axial service load of 1500kN. The safe bearing capacity of the soil is 180 kN/m^2 . Use M20 concrete and Fe 415 steel. Draw the cross-section of the column showing the reinforcement details.

PART-B**Answer any three questions. All carry equal marks.****3 X 12 = 36 Marks**

- 3 Design a rectangle beam from the method of limit state of collapse to resist a bending moment equal to 75 kNm using M 25 concrete and Fe 415 grade steel. Overall depth to breadth ratio may be assumed as 1.5.
- 4 A reinforced concrete beam of rectangular section 300 mm wide is reinforced with four bars of 25 mm diameter at an effective depth of 600 mm. The beam has to resist a factored shear force of 400 kN at support section. Assume $f_c = 25 \text{ N/mm}^2$ and $f_s = 415 \text{ N/mm}^2$, design vertical stirrups for the section.
- 5 8. A short RCC square column is required to carry a factored load of 1900 kN. Design the column. Assume $e < 0.05D$ and use M20 concrete and Fe415.
- 6 i) With neat sketches show various types of shallow footings and briefly explain?
ii) With a neat sketch show various parts of a quarter space landing open dogged legged stair case.
- 7 A square RCC column 400mm x 400mm carries a working load of 650 kN axially. Design a square footing if SBC of soil is 22.5 kN/m^2 . Use M25 grade concrete and Fe 500 grade steel. Use limit state method.

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