SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES
(CIVIL ENGINEERING)

Time: 3 hours   Max.Marks: 60

(Answer all Six Units **6 X 10 = 60** Marks)

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

1 A T-beam and floor system consists of 125 mm thick reinforced concrete slab monolithic with 300 mm wide beams. The beams are spaced at 3.6 m center-to-center and supported by 300 mm wide columns. The clear span of the beam is 6 m. Design an intermediate beam, if the slab is subjected to live load of 2.5 kN/m^2 and dead load of 1.5 kN/m^2. Use M25 concrete and Fe415 steel. Draw the cross-section showing the reinforcement details.

OR

2 Design a slab over a room 4.5 m x 6 m as per IS code. The slab are simply supported on masonry walls all round, with adequate restrained at corners are 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 Fe 415. Sketch the reinforcement details.

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

3 Design a rectangular beam for an effective span of 6 m. the superimposed load is 60 kN/m and size of the beam is limited to 30 cm x 60 cm overall. Use M20 mix and Fe415 grade steel.

4 A reinforced concrete beam of rectangular section has a width of 250 mm and an effective depth of 500 mm. The beam is reinforced with 4 bars of 25 mm diameter on the tension side. Two of the tension bars are bent up at 45° near the support section. In addition the beam is provided with two legged stirrups of 8 mm diameter at 150 mm centers near the support. If f_{ck} = 25 N/mm^2 and f_y = 415 N/mm^2, estimate the ultimate shear strength of the support section.

5 Design a two way slab for a room 5.5 m x 4 m clear in size. If the super imposed load is 5 kN/m^2. Use M25 concrete and Fe 415 steel. Edges of simply supported – corners not held down.

6 A corner column 275 mm × 600 mm located in the multi storey of a system of braced frame, is subjected to factored loads Pu = 2000 kN, Mux = 150 kN-m and Muy = 75 kN-m. The unsupported length of the column is 3.0 m. Design the reinforcement in the column, assuming M30 concrete and Fe415 steel.

7 A square RCC column 400 mm x 400 mm carries a working load of 650 kN axially. Design a square footing if SBC of soil is 225 kN/m^2. Use M25 grade concrete and Fe500 grade steel. Use limit state method.

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