SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations February-2024
STRUCTURAL DESIGN
(Civil Engineering)

Time: 3 Hours   **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	State the assumptions made in limit state of collapse in bending for the design of a reinforced concrete section.	CO1	L1	6M
	b	Draw the strain and stress distribution for singly reinforced beam and derive expression for depth of neutral axis, leaver arm and moment of resistance with respect to concrete and steel.	CO1	L2	6M

OR

2	Design a reinforced concrete beam of rectangular section of effective span 8m to support a design working live load of 30 kN/m. The overall size of the beam has to be restricted to 300 mm x 650 mm. Use M20 grade concrete and Fe 415 grade steel. Effective cover is 50 mm.	CO1	L4	12M

UNIT-II

3	Design a simply supported RCC slab for an office floor having clear dimensions of 4 m x 10 m with 230 mm wall all-round. Using M20 grade concrete and Fe415 grade steel. Live load on the slab is 4 kN/m2 and weight of weathering course over the slab is 1.5 kN/m2 .	CO2	L4	12M

OR

4	Design a two-way slab for a room of size 4 m x 5 m with discontinuous and simply supported edges on all the sides with corners prevented from lifting to support a live load of 4 kN/m2 and weight of weathering course over the slab is 0.6 kN/m2 .Adopt M 20 grade concrete and Fe 415 grade steel.	CO2	L4	12M

UNIT-III

5	Design the reinforcement in a column of size 400 mm × 600 mm, subjected to an axial working load of 2000 kN. The column has an unsupported length of 3 m and is braced against side way in both directions. Use M 20 grade concrete and Fe 415 steel.	CO3	L4	12M

OR

6	Design the longitudinal and lateral reinforcement in a rectangular reinforced concrete column of size 300 mm x 400 mm subjected to a design ultimate load of 1200 kN and an ultimate moment of 200 kNm with respect to the major axis. Use M 20 grade concrete and Fe 415 HYSD bars.	CO3	L4	12M

UNIT-IV

7	a	(a) Explain the various types of bolted connections with neat sketches	CO5	L2	6M
	b	(b) A 18mm thick plate is joined to 16mm plate by 200 mm long(effective) butt weld. Determine the strength of joint if (i) A Double V butt weld is used and (ii) A Single V butt weld is used.	CO5	L3	6M