

**PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)**

III B.Tech I Semester Supplementary Examinations, May - 2024

**DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES
(Civil Engineering)**

Time: 3 hours

Max. Marks: 70 M

Question Paper consists of **PART-A** and **Part-B**

Answer any **ONE** Question from **PART-A** and any **THREE** Questions from **PART-B**

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

Q. No.	Questions	BTL	CO	Marks
Part - A				
1.	Design a three-span continuous beam for an imposed load of 50 kN/m. The effective span is 5m for all spans. The width of beam can be taken as 250 mm. Use M40 grade concrete and Fe500 steel. Draw longitudinal and cross-sections to a suitable scale.	K3	CO2	28 M
OR				
2.	Design a rectangular footing for a R.C. column 250 mm x 500 mm carrying an axial load of 1000 kN. The safe bearing capacity of soil is 250 kN/m ² . Adopt M40 concrete and Fe500 steel. Draw the drawing showing the design details.	K3	CO4	28 M
Part - B				
3.	a) What is meant by limit state? Discuss the different 'limit states' to be considered in reinforced concrete design.	K3	CO1	7 M
	b) Draw stress-strain relationship for concrete and explain it briefly?	K3	CO1	7 M
4.	A T-beam floor consists of 100mm thick R.C.C. slab constructed monolithic with 300mm wide beams. The beams are spaced at 4.0m c/c and their effective span is 5.0m. If the super imposed load on the slab is 6 kN/m ² . Design an intermediate beam. Use M30 grade concrete and Fe415 steel.	K3	CO2	14 M
5.	A rectangular simply supported beam of clear span 5.0m is 350mm x 500mm in cross section. It is reinforced with 6 bars of 16 mm diameter. M30 concrete and Fe415 steel are used. The effective cover is 30 mm, taking superimposed live load as 30 kN/m and dead load as 10 kN/m, calculate the short term and long-term deflections of the beam.	K3	CO3	14 M
6.	Design an RC column of a rectangular section to carry an ultimate load of 600 kN and an ultimate moment of 100 kN.m about major axis (x-x axis). The length of column is 4.0m. Assume the width of the beam equal to 350mm. Use M30 grade concrete and Fe415 grade of HYSD bars.	K3	CO4	14 M
7.	Design a Simply supported R.C. Slab over a room 4m x 6m inside. Assuming that, the corners are not free to lift. The thickness of all the four walls is 250mm, the live load on the floor is 3 kN/m ² and the floor carries a floor finish which weighs 1.0 kN/m. Use M25 concrete and Fe415 steel.	K3	CO5	14 M