BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS) Sub Code: 23CE5T01
III B. Tech I Semester Supplementary Examinations (BR23) MAR/APR-2026
DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES
CIVIL ENGINEERING

Time: 3 hours Max. Marks: 70

Answer any ONE Question from **Part–A**, and any THREE Questions from **Part–B**
Please specify the IS codes to be allowed to the student in the Examination Hall.

PART A (1 X 28 = 28M)

SN	QUESTION	MARKS	CO	BL
1	Design a continuous R.C. slab for a class room 6m wide and 12m long. The roof is to be supported on R.C.C. beams spaced at 3.0m intervals. The width of beam should be kept 250mm. The superimposed load is 3kN/m2 and finishing load expected is 1kN/m2. Use M20 concrete and Fe 500 steel.	28 M	CO4	BL6
	(or)			
2	Design an isolated square footing to carry column load 800 kN and moment 30 kN-m respectively. Assume safe bearing capacity of soil 120 kN/m2 and use concrete grade M30 and Steel reinforcement Fe500. Apply relevant design checks for strength and serviceability conditions. (Use Limit State Method). Neatly sketch the footing section and detail the reinforcement and connection between the column and footing.	28 M	CO5	BL6
	PART B			
3	Find the cross-sectional area of concrete and steel for a R.C simply supported rectangular beam of effective span 5 m, carrying dead load 3 kN/m and live load 6 kN/m. Use concrete grade M25 and HYSD steel Fe500. Use working stress method. Assume the following data: Steel Young's modulus Es=2.0×10^5 MPa, modular ratio m=10 and clear cover = 35 mm.	14 M	CO1	BL4
4	Determine the minimum effective depth required and the corresponding area of tension reinforcement for a rectangular beam having a width of 250 mm to resist an	14 M	CO2	BL5

	ultimate moment of 250 kN·m. Using M25 grade concrete and Fe-500 HYSD bars.			
5	A rectangular R.C beam of size 300 × 450 mm reinforced with 3 nos. 16 mm tensile steel and simply supported over an effective span of 5 m subjected to total dead load 4 kN/m and imposed load 10 kN/m. Use M25 concrete and steel Fe500. Design the beam for shear reinforcement in combination of vertical stirrups and bent-up bars.	14 M	CO3	BL6
6	Design the reinforcement of an R.C square column 350 × 350 mm size fixed at both ends over a clear height of 5 m. The column is carrying an axial load of 40 kN and a moment of 3 kN·m. Apply relevant design checks and neatly detail the reinforcement. Use concrete grade M30 and HYSD steel Fe500.	14 M	CO4	BL6
7	Design a waist slab type dog legged staircase for an office building using the following data:Height between floors = 3.0 mTread = 280 mm and riser = 150 mmWidth of flight = landing width = 1.5 mThe stairs are supported on 350 mm load bearing masonry walls at the outer edges of the landing, parallel to the risers.Materials: M25 grade concrete and Fe500 HYSD bars.	14 M	CO5	BL6

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