B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E.   Semester: VII
Branch: Civil Engineering   Duration: 3 hrs.
Course Code: 21CV7PEADR   Max Marks: 100
Course: Advanced Design of R C Structures

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
                       2. Missing data, if any, may be suitably assumed.
                       3. Use of IS 456-2000, SP-16 handbook, IS 3370-Part I, II, III, IV is allowed.

			CO	*PO*	Marks
		UNIT - I			
1		Design a continuous rectangular R.C. beam to support a dead load of 10 kN /m and Live load of 15 kN /m over four column supports of effective span 6.0m each. Assume mild exposure condition. Use BM and SF coefficients specified in IS 456	*CO 1*	*PO 3*	**20**
		UNIT - II			
2		Design an interior panel of a flat slab with following data Size of Floor- 20m x 20m Size of Panel- 5m x 5m Live Load- 4 kN /m^2. Size of column- 500mm diameter Assume mild exposure condition. Drops have to be provided.	*CO 1*	*PO 3*	**20**
		OR			
3		A flat slab is supported on 500mm diameter columns spaced 6m x 5m apart in both directions. The column head has a diameter of 100cm. The live load on the slab is 5 kN /m^2. Determine the unbalanced moments in an interior column. Also, check the flat slab in shear at interior support	*CO 1*	*PO 3*	**20**
		UNIT - III			
4		A reinforced concrete grid floor is to be designed to cover a floor area of size 12m x 15m. The spacing of ribs in mutually perpendicular direction is 2m c/c. Take Live load as 3kN /m^2 and load due to floor finishes as 1.5 kN /m^2. Assume mild exposure condition. Assume the thickness of top slab as 100mm. Design the ribs of the grid floor using IS method.	*CO 2*	*PO 3*	**20**
		UNIT - IV			
5		An elevated circular water tank is planned to store 500kl water with a top dome. The tank is supported on a masonry tower. The	*CO 3*	*PO 3*	**20**

		depth of water in tank is 5m. Take unit weight of water as 10 kN /m^3. Take live load on dome as 1.0 kN /m^2. Design the roof dome, ring beam and tank walls.			
		OR			
	6	An underground water tank of size 10m x 4m x 5m is planned to store water. For the following data given below, Design the long wall and short wall of the rectangular tank for critical conditions. Type of soil- Submerged sandy soil, γs= 16 kN /m^3 and φ=30^0 Water table cam rise up to ground level. Take unit weight of water = γw=10 kN /m^3 Use M30 concrete and Fe 415 steel.	*CO 3*	*PO 3*	**20**
		UNIT - V			
	7	The columns in a portion of a building are arranged in a grid of size 9m x 9m with their spacing of 3.0 m apart in mutually perpendicular directions. Take the SBC of soil = 180 kN /m^2. The service load on each column can be taken as 425 kN. Adopt M30 grade concrete and Fe 415 steel. Take the size of column = 0.3m x 0.3m. Design a mat footing connecting the columns.	*CO 4*	*PO 3*	**20**

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