Sanjay Ghodawat University, Kolhapur 2019-20

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017 EXM/P/09/01

Year and Program:2019-20 **School of Technology** **Department of FY M.Tech**

Course Code: CSE502R1 **Course Title: Advanced Design of Concrete Structures** **Semester – I**

Day and Date Wednesday 18/12/19 **End Semester Examination (ESE)** **Time:** 4hr 10.30am to 2.30pm **Max Marks: 100**

Instructions:
1) All questions are compulsory.
2) assume suitable data wherever necessary.
3) Figures to the right indicate full marks.
4) Use of IS: 456, IS: 1343 IS: 1893 IS: 3370 and SP: 16 allowed

			Marks	Bloom's Level	CO
Q.1		**Solve**			
	a)	A concrete column of 400 mm diameter, reinforced with 8 bars of 20 mm dia., is braced and hinged at both ends, 8 m apart. Check the safety of the column if it carries a factored axial load of 1100 kN. Take M20 concrete and Fe415 steel, effective cover is 60 mm. Take additional moment due to slenderness is 51.55 kN-m	15	L_3	CO1
		OR			
	a)	Determine the maximum factored load carrying capacity of a square column, 400 mm X 400 mm reinforced with 8 bars of 25 mm dia., uniformly spaced along all the four sides with an effective cover of 60 mm. The column is braced against side sway and has unsupported length of 5.5 m and effective length factor of 1 about both the axis assume M20 concrete, and Fe415 steel.	15	L_3	CO1
Q.2		**Solve**			
	a)	Describe joints in multistoried buildings. Sketch The details of reinforcement at joint sections.	12	L_3	CO1
		OR			
	a)	Find design moment and Reinforcement in an interior panel of a flat slab with panel size 6m X 6m supported by columns of size 500 X 500 mm Provide suitable drop. Take Live Load as 4 kN/m^2. Use M20 concrete and Fe 415 Steel.	12	L_3	CO2
Q.3		**Solve any One**			
	a)	Design a flat bottom circular elevated water tank of diameter 12 m and total height 5 m which is to be supported by ring beam of 8.0 m diameter. The ring beam is to be supported by six columns equally placed. Use M25grade concrete and Fe 415 steel. Design top dome of water tank.	15	L_4	CO2

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	b)	Design a flat bottom circular elevated water tank of diameter 12 m and total height 5 m which is to be supported by ring beam of 8.0 m diameter. The ring beam is to be supported by six columns equally placed. Use M25grade concrete and Fe 415 steel. Design wall of water tank. m = 11.	15	L_4	CO2
Q.4		**Solve any One**			
	a)	Design a typical interior span of a continuous deep beam using the following data – Clear span of Beam = 4m, Overall depth= 4.5m, Width of support = 0.45m, width of beam= 0.3 m, Superimposed load on beam =350kN/m , Use M20 grade of concrete and Fe 415 HYSD bars. Sketch The details of reinforcement at center of span and support sections.	17	L_3	CO3
	b)	Design a single span deep beam to suit the following data- Effective span = 6m, Overall depth= 6m, Width of support = 0.6m, width of beam= 0.4 m, Total load on beam including self-weight =400kN/m, Use M20 grade of concrete and Fe 415 HYSD bars. Sketch The details of reinforcement of sections.	17	L_3	CO3
Q.5		**Solve any One**			
	a)	A square slab of size 6m X 6m is reinforced with 10mm dia. Fe415 steel bars at a spacing of 180 mm in both directions. The average effective depth may be taken as 120 mm and overall as 150 mm. Determine the permissible service load if grade of concrete mix is M20, assuming it is simply supported all around.	17	L_4	CO4
	b)	Design a Simply Supported square slab of side 3.6 m to carry a service load of 4 kN/M^2. Use M20 Grade of concrete and Fe415 grade of steel. Sketch The details of reinforcement of sections.	17	L_4	CO4
Q.6		Solve any Three			
	a)	Justify yield line theory for the analysis of slab.	08	L_6	CO4
	b)	Summaries the Characteristic features of yield line.	08	L_5	CO4
	c)	Relate difference between deep beam and simple beam and explain concept of deep beam.	08	L_5	CO3
	d)	Decide how much horizontal reinforcement is required for 300 mm wide and 4000 mm deep beam.	08	L_6	CO3

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