CBCS SCHEME

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BCV601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Design of RCC Structures

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of IS456:2000, SP- 16 is permitted
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Compare Working Stree method and limit state method of design.	08	L2	CO1
	b.	Explain the stress block parameters with a neat sketch and derive the expression	12	L2	CO1
		OR			
Q.2	a.	Explain the terms: i) under reinforced section ii) balanced section ii) Over reinforced section	06	L2	CO1
	b.	A simply supported beam has a rectangular section and carries a uniformly distributed load of 20KN/m over a clear span of 5m. The cross – section is 300mm x 650mm and is reinforced with 4 numbers of 20mm diameter bar. Assume cover = 25mm and bearing = 300mm. Assuming M20 grade concrete and Fe415 steel, compute short and long term deflection of the beam.	14	L3	CO1
		Module – 2			
Q.3		Determine the moment of resistance of T section having the following section properties: Width of flange = 2500mm, Depth of flange =150mm, Width of rib = 300mm, Effective depth = 800mm, Area of steel = 8 bars of 25 mm diameter. Use M20 concrete and Fe415 HYSD bar.	20	L3	CO2
		OR			
Q.4		A doubly reinforced concrete beam having a rectangular section 250mm width and 540mm overall depth is reinforced with a 2 bars of 12mm diameter in the compression side and 4bars of 20mm diameter in the tension side. The effective cover to bars is 40mm. Using M20 grade concrete and Fe415 HYSD bars, estimate the flexural strength of the section using IS456:2000 code recommendations.	20	L3	CO2
		Module – 3			
Q.5		Design a rectangular beam of section 230mm x 600mm of effective span 6m and effect cover for reinforcement = 50mm. Imposed load on the beam is 40KN/m. Use M20 concrete and Fe415 steel.	20	L4	CO2
		OR			
Q.6		Design a simply supported beam of span 5m carries a characteristic live load of 12 KN/m. Use M20 grade of concrete and Fe 415 steel.	20	L4	CO2
		Module – 4			
Q.7	a.	Explain one way and two way slab with examples.	04	L2	CO3,4
	b.	Design a slab over a room of internal dimension 4m x 5m on 230mm thick brick wall. All edges are simply supported (corner of the slab are held down). Use live load 3KN/m^2, floor finish 1KN/ m^2. Use M20 and Fe415. Apply check for deflection with the reinforcement details.	16	L4	CO3,4

		OR			
Q.8		Design a dog legged staircase for an office building in a room measuring 2.8m x 5.8m clear. Vertical distance between the floors is 3.6m. width of flight is 1.25 m. Allow a live load of 3KN/ m^2, sketch the reinforcement details. Use M20 and Fe415. Assume the stairsare supported on 230mm wall at the end of outer edges of landing slabs.	**20**	**L4**	**CO3,4**
		Module – 5			
Q.9		Design a square footing for a short axially loaded column of size 300mm x 300mm carrying 600 KN load. Use M20 concrete and Fe415 steel. SBC of soil is 180 KN/ m^2. Sketch the details of reinforcement.	**20**	**L4**	**CO1**
		OR			
Q.10		Design a isolated footing for a rectangular column of 300mm x 500mm supporting an axial load of 1000 KN factored. Assume SBC of soil as 1KN/ m^2. Use M20 and Fe415. Sketch the reinforcement and perform the necessary checks	**20**	**L4**	**CO3,4**

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