Hall Ticket Number :										

R-19

Code: 19A151T

III B.Tech. I Semester Supplementary Examinations June 2024

Basic Reinforced Concrete Design

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**

2. In Part-A, each question carries **28 marks.**

3. In Part-B, each question carries **14 marks.**

PART-A

Answer *any one* questions

Answer *any one* questions (1 X 28 = 28 Marks)

		Marks	CO	BL
1.	A simply supported slab of a corridor of a hospital building of span 2.5x5.5m and is supported on beams of 230mm wide. Design the slab, if the beam is carrying a live load of 5KN/m. Use M_{20} concrete and fe_{415} steel.	28M	3	4
	OR			
2.	Design a one –way RCC slab for an office floor having to carry a load of 8000 N/m^2 inclusive of its own weight over its effective span of 3.5 m simply supported at its ends. Assume M 20 grade concrete and Fe 415 steel. Sketch the reinforcement details	28M	3	4

PART-B

Answer any *three* questions from the following (3 x 14 = 42 Marks)

		Marks	CO	BL
3.	Design the shear reinforcement of a cantilever beam with span 3m has an effective depth of 400mm and width of 250mm.It carries a load of 75KN/m including self weight. It is reinforced with 4 bars of 20mm diameter. Use M_{20} grade concrete and Fe_{415} steel.	14M	3	4
4.	Determine the anchorage length of 4 nos. of 20mm diameter reinforcing bars going into the support of the simply supported beam of b = 300 mm, D= 600 mm, effective cover = 50 mm. The factored shear force V= 280 kN, width of the column support = 300 mm. Use M 20 concrete and Fe 415 steel.	14M	2	4
5.	A simply supported slab of a corridor of a hospital building of span 2.5x5.5m and is supported on beams of 230mm wide. Design the slab, if the beam is carrying a live load of 5KN/m. Use M_{20} concrete and fe_{415} steel.	14M	3	3
6.	Determine the area of tensile reinforcement required in a R.C.C. beam 225mm x 450 mm subjected to bending moment of 28125 Nm. Use M20 concrete and Fe415 steel.	14M	1	3
7.	A simply supported beam of cross section of width 200mm and overall depth 400mm is provided with 3- 16 mm diameter HYSD bars in tension. Cover to the reinforcement is 40mm, The span of the beam is 5.0m, The beam is subjected to a uniformly distributed dead load of 10 kN/m and a live load of 15kN/m. Half of the imposed load is permanent. Calculate the total long-term deflection at the mid-span. fck=40 N/mm^2 , fy=415 N/mm^2 , θ=2.5, creep coefficient, ε_{cs}=0.0003.	14M	5	3

*** End ***

Hall Ticket Number :										

R-19

Code: 19A154T

III B.Tech. I Semester Supplementary Examinations June 2024

Structural Analysis

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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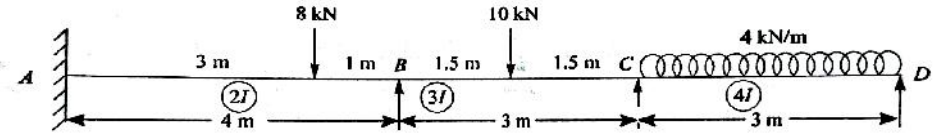
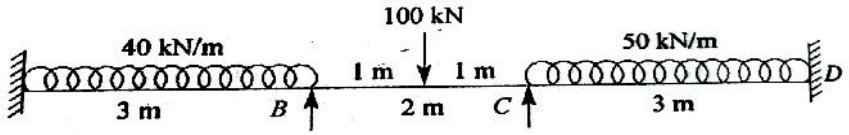
		Marks	CO	BL
	UNIT–I			
1.	Derive slope and deflection for a fixed beam carrying a point load at the centre.	14M	CO1	L2
	OR			
2.	A fixed beam of length 20m, carries a uniformly distributed load of 8KN/m on the left half together with a 120KN load at 15m from the left-hand end. Find the end reactions and fixing moments and magnitude and the position of the maximum deflection. Take E= $2x10^8$ KN/m^3 and I= $4x10^8$ mm^4.	14M	CO1	L2
	UNIT–II			
3.	Derive Clapeyron's Equation of three moments.	14M	CO2	L2
	OR			
4.	A continuous beam ABCD of length 20m rests on four supports at which spans AB and CD of length 7m and BC of length 6m. span AB and CD carrying an UDL of 5KN/m and span BC carrying a point load of 7KN at its centre.	14M	CO2	L2
	UNIT–III			
5.	Determine the support moments for the continuous beam shown in figure and draw the B.M diagram. Analyse in slope-deflection method 	14M	CO3	L5
	OR			
6.	Determine the support moments for the continuous beam shown in figure and draw the B.M diagram. Analyse in Moment Distribution method 	14M	CO3	L5
	UNIT–IV			
7.	A u.d.l of 5 KN/m, covering a length of 15 m, crosses a girder of span 50 m. Find the values of maximum shear force and bending moment at a section 10m from the left-hand support.	14M	CO4	L4
	OR			
8.	Explain in detail the influence lines for a single concentrated load. Draw the figures	14M	CO4	L4
	UNIT–V			
9.	a) State and derive Castigliano's first theorem. b) Explain the application of Castigliano's first theorem to pin jointed frames.	14M	CO5	L4
	OR			
10.	Explain the following. a) Strain energy. b) Kinematic Indeterminacies. c) External Indeterminacies.	14M	CO5	L4

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III B.Tech. I Semester Supplementary Examinations June 2024

Soil Mechanics

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.	a)	Define phase diagram. Differentiate between void and porosity and also derive relation between them	7M	CO1	L1
	b)	A moist soil sample weighs 3.52N After oven drying in an oven, its weight is reduced to 2.9N. the specific gravity of solids is 2.65 and mass specific gravity is 1.85. Determine water content, void ratio, porosity and degree of saturation.	7M	CO1	L3
		OR			
2.	a)	Discuss the importance of Atterberg's limits in soil engineering	7M	CO1	L1
	b)	A soil has liquid limit of 25% and a flow index of 12.5%. If the plastic limit is 15% then determine plasticity index and toughness index. If the water content of the soil in natural condition is 20% then find liquidity index and relative consistency.	7M	CO1	L3
		UNIT–II			
3.	a)	Explain why the capillary rise is greater for fine grained soils than for coarse grained soils and what is the effect of temperature of capillary rise of water in soil.	7M	CO2	L2
	b)	A glass tube of 0.02mm diameter. Determine the height to which water will rise in this tube by capillary action.	7M	CO2	L2
		OR			
4.	a)	Differentiate between variable head and constant head permeability tests	7M	CO2	L2
	b)	A sample in a variable head permeameter is 8cm in diameter and 10 cm high. The permeability of the sample is estimated to be 0.001mm/s. if it is desired that the head in the stand pipe should fall from 24cm to 12cm in 3min. determine the size of the stand pipe which should be used	7M	CO2	L3
		UNIT–III			
5.	a)	Derive an expression for the vertical stress on vertical axis passing through the center of uniformly loaded circular area.	7M	CO3	L2
	b)	A circular footing of 1.5m radius transmits a uniform pressure of 90kN/m^2. Calculate the vertical stress at a point 1.5m directly beneath its center.	7M	CO3	L3
		OR			
6.	a)	Distinguish between Standard and modified Proctor compaction tests.	7M	CO3	L1
	b)	Write about compaction curve. Give its salient features. What is zero air void line?	7M	CO3	L1
		UNIT–IV			
7.	a)	Differentiate between primary and secondary consolidation of soil	7M	CO4	L1

	b)	The void ratio of clay A decreased from 0.572 to 0.505 under a change in pressure from 120 to 180 kg/m^2. The void ratio of clay B decreased from 0.612 to 0.597 under a change in pressure from 120 to 180 kg/m^2. the thickness of sample A was 1.5 times that of B. the time required for 50% consolidation was 3 times longer for sample B than for sample A. what the ratio of coefficient of permeability of A to B	7M	CO4	L3
		OR			
8.	a)	How would you determine the time settlement curve in the field?	7M	CO4	L1
	b)	Write short note on time factor. How is it related to the average degree of consolidation?	7M	CO4	L1
		UNIT–V			
9.	a)	Explain factors affecting shear strength of cohessive soils.	7M	CO5	L2
	b)	Explain the liquefaction of soil phenomenon.	7M	CO5	L1
		OR			
10.		Describe tri axial shear test. Discuss the merits and demerits of tri axial shear test.	14M	CO5	L2

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