Code: 19A151T

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2023
Basic Reinforced Concrete Design
(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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PART-A
Answer any one question from the following

1.	A simply supported RCC beam carries an UDL of 30KN/m over an effective span of 6.5m.The overall size of the beam has to be restricted to 300x580mm.Design the mid span section of the beam for flexure. Use M_{20} concrete and fe_{415} steel.	28M	3	3
2.	Design a footing subjected to a column load of 1000KN of size 400mm×400mm. The safe bearing capacity of soil is 200KN/m². Use M20 grade concrete and Fe_{415} steel. The column has 4 no's of 25mm bars.	28M	5	3

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

3.	Determine the moment of resistance by limit state method for a simply supported beam of size 350X400mm and a span of 6m, which is subjected to UDL of intensity 5KN/m. Use M_{25} concrete and Fe $_{415}$ steel. Assume any required data	14M	1	2
4.	Estimate the development length in both tension and compression zones of a beam size 300X400mm with the area of steel in compression and tension is 456mm² and 345mm². Use M_{20} grade concrete and mild steel bars. Assume any required data.	14M	2	3
5.	A floor consists of 150mm thick slab monolithically constructed with 300mm wide beams spaced at 3.6m C/C spacing. The effective span of beams is 5m and the slab is subjected to a superimposed load of 5KN/m². Design an intermediate beam by using M $_{20}$ concrete and Fe $_{415}$ steel.	14M	3	2
6.	Design the reinforcement in a column of size 400 mm x 600 mm subjected to an axial load of 2000 kN under service dead load and live load. The column has an unsupported length of 4.0 m and effectively held in position and restrained against rotation in both ends. Use M 25 concrete and Fe 415 steel.	14M	4	2
7.	A cantilever beam of span 4m and size=300x600 mm, is subjected to a Maximum bending moment, M =160 kNm. Under service conditions due to UDL. The beam is reinforced with 4-#20 on the tension face at an effective cover=50mm. M20 and Fe 415 steel. Compute deflection due to short and long term effects.	14M	5	2

Hall Ticket Number :

R-19

Code: 19A154T

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2023
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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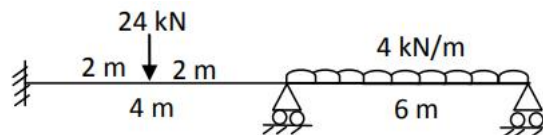|		Marks	CO	BL

UNIT–I

1. A fixed beam AB of span 6 m is carrying a u.d.l of 4 t/m over the left half of the span. Find the fixing moments and support reactions. Draw BMD.   14M CO1 L1

OR

2. Derive slope and deflection for a fixed beam carrying an eccentric point load.   14M CO1 L2
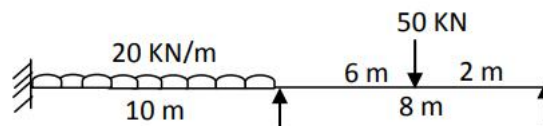
UNIT–II

3. Analyze the continuous beam shown in figure by Clapeyron's theorem of three moments. Draw BMD and SFD
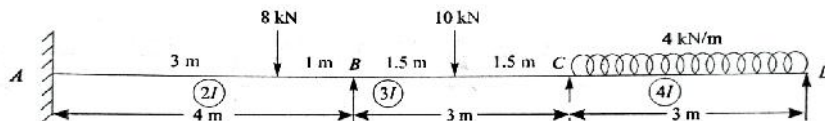

   14M CO2 L2

OR

4. Analyze the continuous beam shown in figure by theorem of three moments. Draw SFD & BMD.

   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 L3

OR

6. A beam ABC 9m long consists of spans AB and BC of lengths 6m and 3m respectively. It is fixed at the end A and simply supported at B and C. the span AB carries a UDL of 10 kN/m while the span BC carries a UDL of 20kN/m. Determine the reactions and moments at the supports and draw B.M diagram.   14M CO3 L2

UNIT–IV

7. a) Define influence line for shear force and bending moment.
   b) A girder of span 7m is loaded with an UDL of length 3m of intensity 80kN/m, located as its left end is 1m from left end of the girder. Find the shear force at a section distant 3m from left end   14M CO4 L4

OR

8. Draw the influence lines for reactions at supports A, B, C and bending moment at support B for the beam. Find their maximum values when a travelling load of 60kN per metre may cover any part of the span.   14M CO4 L4

UNIT–V

9. Write short notes on:
   (a) Static indeterminacy.
   (b) Castigliano's theorem for indeterminate structures   14M CO5 L5

OR

10. A lamp post ABC consists of a vertical part AB of length L and A horizontal part BC of length L/8 the lower end A of the post being fixed. It carries a point load P at C. Find the vertical and horizontal components of the deflection of C. Assume uniform flexural rigidity EI.   14M CO5 L3

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