Course Code: 195019 Roll No: MLRS- R19

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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III B.Tech I Sem Regular End Examination, January 2022

Structural Analysis – II

(CIVIL)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

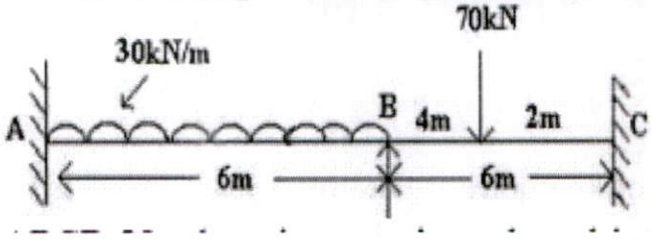
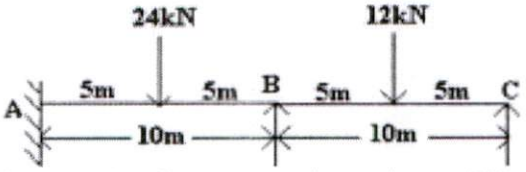
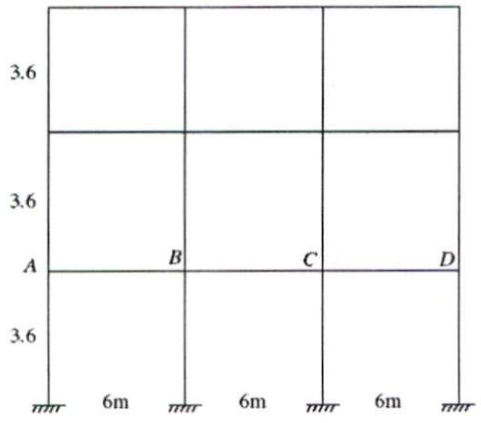
1.	a)	Write the expression for bending moment at any section of a Two hinged parabolic arch subjected to udl	2M	CO1	BL1
	b)	Define the terms 'Stiffness' and 'Distribution factor'	2M	CO1	BL2
	c)	What are the reasons for side sway of a Portal frame?	2M	CO2	BL1
	d)	Contrast between the moment distribution and Kani's methods of analysis	2M	CO2	BL2
	e)	List the advantages of approximate methods of analysis?	2M	CO3	BL1
	f)	What are the assumptions made in the Portal Method?	2M	CO3	BL1
	g)	What is meant by Kinematic indeterminacy?	2M	CO4	BL1
	h)	Define 'Flexibility'.	2M	CO4	BL2
	i)	What are the uses of 'influence lines'?	2M	CO5	BL1
	j)	State Muller-Breslau principle	2M	CO5	BL1

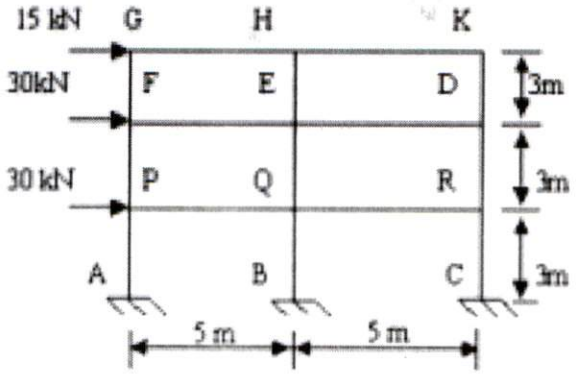
PART- B

(10*5 Marks = 50 Marks)

2	A two hinged parabolic arch of 32 m span and central rise of 4 m. It carries a *udl* of 20 kN/m over the right half of the span and concentrated load of 180 kN at the crown. Locate and find the magnitude of maximum bending moment. Also find the shear force and normal thrust at quarter span section from the left support. Assume that moment of inertia at a section varies as secant of the slope. Neglect the effect of rib shortening	10M	CO1	BL4

OR

3	Analyse the portal frame shown in Fig.1, using Moment Distribution method. Draw bending moment diagram and elastic curve. 	10M	CO1	BL4
4	Analyse the frame shown in Fig.2 using Kani's method, and draw shear force and bending moment diagrams. Draw elastic curve. 	10M	CO2	BL4
	OR			
5	A cable in a suspension bridge has a span of 110 m and a central dip of 10 m. It carries a load of 16 kN/m. Find the maximum tension and inclination of the cable at supports. Also determine the forces transmitted to the tower if the cable is : a) Passing over smooth pulley on the top of the pier. b) Clamped to the saddle with roller support. The anchor cable is inclined at 36° with the horizontal.	10M	CO2	BL4
6	Calculate the moment at mid-span BC for portal frame shown in Fig.3, if it is loaded with live loads on the spans AB and CD, in addition to the dead load. Use substitute frame Method. Dead load = 18 kN/m and Live load = 24 kN/m. 	10M	CO3	BL4
	OR			
7	Analyze the frame shown in figure, for forces in top storey by Portal method. Assume that all the columns have equal area of cross-section for the purpose of analysis.	10M	CO3	BL4



8 Analyse the continuous beam shown in the Fig.4 using Stiffness Method. Draw shear force and bending moment diagrams. Also draw Elastic curve. 10M CO4 BL4

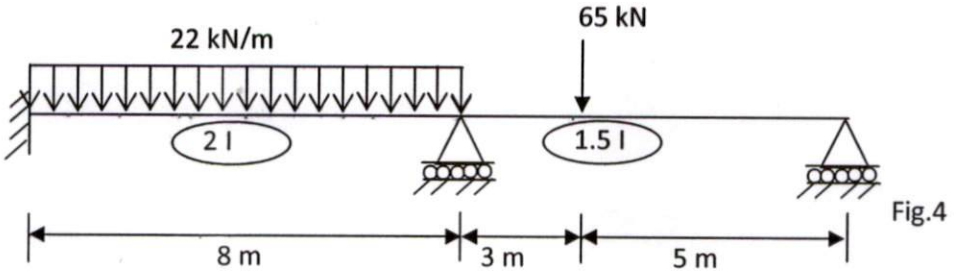
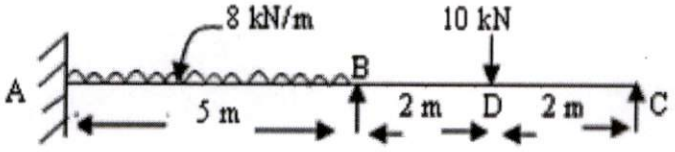


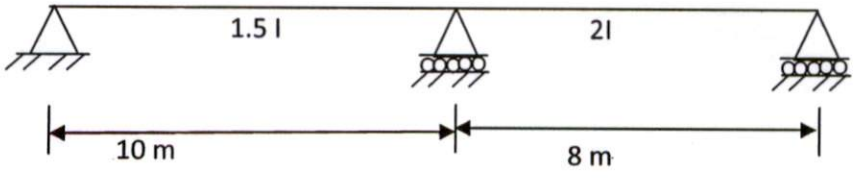
Fig.4

OR

9 Analyse the continuous beam shown in the Fig.5 using Flexibility Method. Draw shear force and bending moment diagrams. Assume constant EI throughout the beam. Also draw Elastic curve. 10M CO4 BL4



10 Draw the influence for reaction at the middle support. Compute the ordinates at 2 m intervals. 10M CO5 BL4



OR

11 Draw the ILD for a propped cantilever beam having span 10m for reaction and moment at fixed end. 10M CO5 BL4

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