



Regulation: R18

Subject Code: 2P4AD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech IV Semester Supplementary Examinations, February 2024

Structural Analysis-I

(Civil Engineering)

Maximum Marks: 70

Date: 23.02.2024 Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10X2M = 20 Marks)

CO

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1.	Classify different types of indeterminacies?	CO1	L2
2.	Draw different types of supports and name them	CO1	L3
3.	What are different types of frames?	CO2	L1
4.	Relate one difference between propped cantilever beam & fixed beam	CO2	L2
5.	Define Strain energy	CO3	L1
6.	State Castagliano's theorem	CO3	L1
7.	Explain continuous beam with neat diagram	CO4	L2
8.	Define distribution factor	CO4	L1
9.	Define moving load and give one example.	CO5	L1
10.	Define influence line	CO5	L1

Part-B

Answer all the following questions.

(5X10M = 50 Marks)

11.	A Cantilever of length 5m carries a point load of 24Kn at its center. The cantilever is propped rigidly at the free end. Determine the reactions at the rigid prop. [10M]	CO1	L5
OR			
12.	A fixed beam of length 6m carries point loads of 20Kn and 15Kn at distance 2m and 4m from the left end A. Find the fixed end moments and the reactions at the supports. Draw B.M and S.F diagrams. [10M]	CO1	L5
13.	For truss shown in fig.[i] Determine reactions at two supports A and B. Find forces in members 4,5 & 7. [10M]	CO2	L4

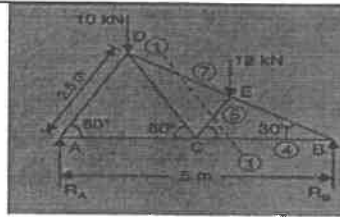


Fig.[i]

OR

14. Determine the forces in the truss shown in fig.[ii] which carries a horizontal load of 12 kN and a vertical load of 18 kN. [10M]

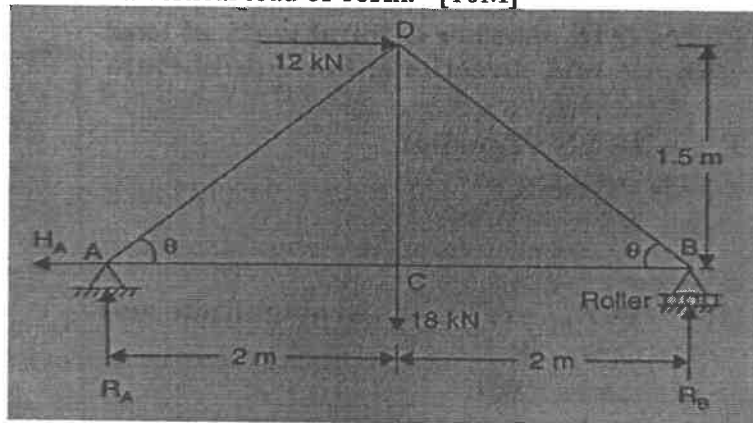


Fig.[ii]

15. A three hinged parabolic arch of span 100m and rise 20m carries a uniformly distributed load of 2 kN/m length on the right half as shown in the fig.[iii]. Determine the maximum bending moment in the arch. [10M]

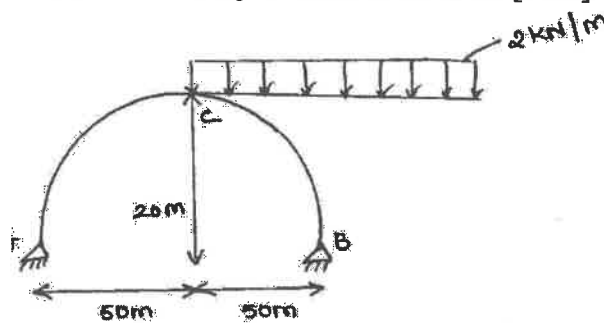
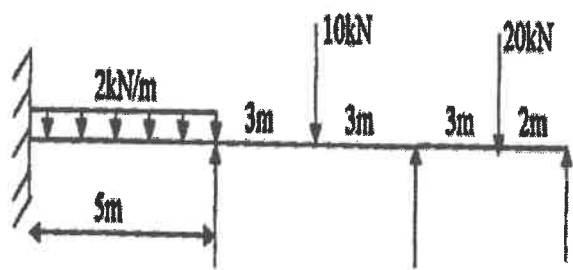
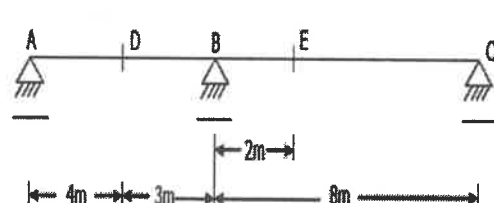


Fig.[iii]

OR

16. a) Derive Castigliano's First Theorem. [5M]
b) Find the deflection at the free end of a cantilever of length L Carrying UDL of W per unit length over the whole span. Assume uniform flexural rigidity. [5M]
17. A beam ABCD, 16m long is continuous over three spans AB=6m, BC = 5m & CD = 5m the supports being at the same level. There is a UDL of 15 kN/m over BC. On AB, is a point load of 80 kN at 2m from A and CD there is a point load of 50 kN at 3m from D, Determine the moments by using moment

	distribution method. Assume EI const. [10M]		
	OR		
18.	Analyze the continuous beam as shown in fig.4 by using moment distribution method. EI is constant. Draw the bending moment diagram and shear force diagram. [10M]  Fig. 4	CO4	L4
19.	A beam ABC is supported at A, B and C as shown in fig 5.. It has the hinge at D. Construct the influence lines for: [10M] - reactions at A, B and C - shear to the right of B - bending moment at E  Fig.5	CO5	L6
	OR		
20.	Sketch the influence line diagram for S.F & B.M at 5m from the right end of a simply supported girder of span 15m. Hence find the maximum S.F and maximum B.M at the section if two wheel loads of 10Kn and 18Kn spaced 4m apart move from left to right. [10M]	CO5	L6

