R20 Regulation *Subject code:3P4AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, December 2024

Structural Analysis-I

(Civil Engineering)

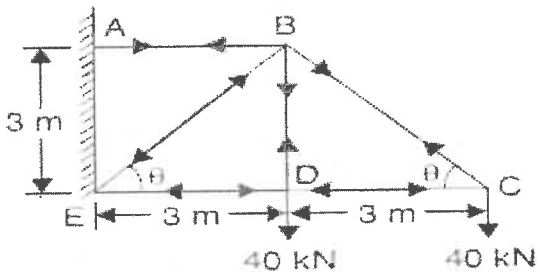
Maximum Marks: 70 Date:12.12.2024 Duration: 3 hours

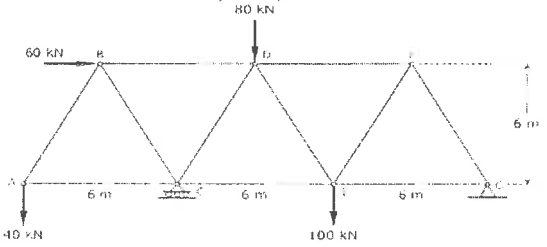
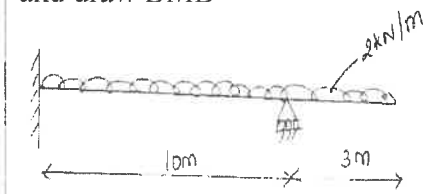
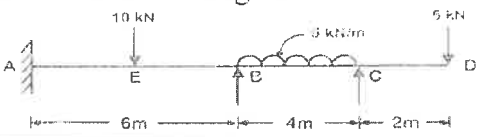
Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	Write different types of indeterminacies?	1	L1
2	Define prop cantilever beam.	1	L1
3	What are different types of frames?	2	L1
4	Define tension coefficient.	2	L1
5	Define strain energy.	3	L1
6	What are the types of arches?	3	L1
7	Write Continuous beam with neat diagram?	4	L2
8	Define Elastic curve.	4	L1
9	Define Focal Length.	5	L1
10	List out the uses of Influence lines.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	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]	1	L3
	OR		
12	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]	1	L3
13	Determine the forces in all the members of the truss shown in Fig.  [10M]	2	L4
	OR		

14	The Warren truss loaded as shown in Fig. P-418 is supported by a roller at C and a hinge at G. By the method of joints. Determine the forces in the members DE, DF, and CE.  Figure P-418 [10M]	2	L4
15	Find the central deflection of a simply supported beam carrying a concentrated load at mid span. Assume flexural rigidity. [10M]	3	L3
	OR		
16	A three hinged symmetric parabolic arch hinged at the crown and springing, has a span of 15m with a central rise of 3m. It carries a distributed load which varies uniformly form32kN/m (horizontal span) over the lefthand half of the span. Determine the normal thrust; shear force and bending moment at 5 meters from the left end hinge. [10M]	3	L3
17	Analyze the continuous beam given in figure by slope deflection method and draw BMD  [10M]	4	L4
	OR		
18	Analyze the continuous beam as shown in figure below by using moment distribution method. EI is constant. Draw the bending moment diagram and shear force diagram.  [10M]	4	L4
19	Construct the influence diagram for reactions and bending moment at any section of a simply supported beam. Using the ILD, determine the support reactions and find bending moment at 2m, 4m and 6m for a simply supported beam of span 8m subjected to three-point loads of 10kN, 15kN and 5kN placed at 1m, 4.5m and 6.5m respectively. [10M]	5	L3
	OR		
20	Two concentrated rolling loads of 12 KN and 6 KN placed 4.5 m apart, travel along a freely supported girder of 16m span. Draw the diagrams for maximum positive shear force, maximum negative shear force and maximum bending moment. [10M]	5	L3