R18 Regulation Subject code: 2P4AD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, September 2023

Structural Analysis-I

(CE Department)

Maximum Marks: 70 Date:24.09.2023 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)

1 Name different types of indeterminacies?
2 Distinguish between cantilever beam and propped cantilever beam.
3 What are the methods are used to analyze the perfect frame?
4 Distinguish between two hinged and three hinged arch.
5 Define Unit load method.
6 State Castigliano's theorem.
7 Write Slope deflection equation in continuous beam?
8 Define carry over factor of moment distribution method.
9 Define moving load and give one example.
10 Define influence line.

Part-B

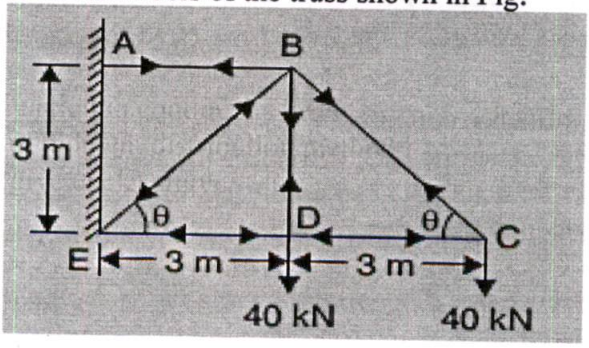
Answer All the following questions. (5X10M=50Marks)

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)

OR

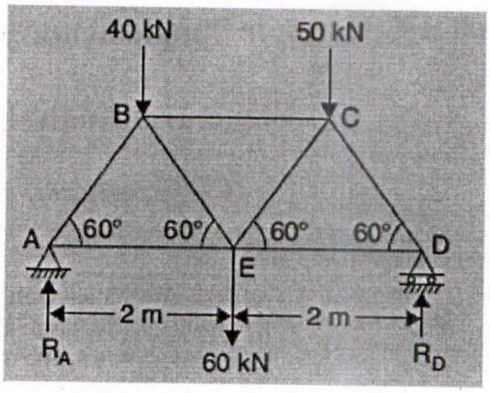
12 Analyze a propped cantilever beam carrying an UDL of intensity W Kn/m over a entire span , draw SFD & BMD (10M)

13 Determine the forces in all the members of the truss shown in Fig. (10M)



OR

14 Determine the forces in all the members of the truss shown in Fig. and indicate the magnitude and nature of forces on the diagram of the truss. All inclined members are at 60° to horizontal and length of each member is 2 m. (10M)

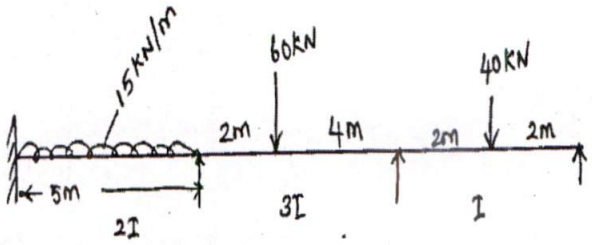


15 Find the deflection of the centre of a beam of span L carrying a uniformly distributed load of W per unit run over the whole span .Assume uniform flexural rigidity. (10M)

OR

16 A three hinged symmetric parabolic arch hinged at the crown and supports, has a span of 15m with a central rise of 3m. It carries a uniformly distributed load of intensity 32kN/m (horizontal span) over the left half of the span. Determine the normal thrust; shear force and bending moment at 5 meters from the left end hinge. (10M)

17 Analyze the continuous beam given in fig. by slope deflection method and draw the B.M.D. (10M)



OR

18 Using moment distribution method analyse the two span continuous beam ABC, having end supports A and C fixed. There is a load of 5kN in span AB=5m at 3m from A, While on span BC=5m there is a load of 8kN at 2.5m from C. Sketch the BMD. (10M)

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)

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 10 kN and 18 kN spaced 4m apart move from left to right. (10M)