

ANURAG Engineering College
(An Autonomous Institution)

II B.Tech II Semester Supplementary Examinations, December – 2024

STRUCTURAL ANALYSIS – I
(CIVIL ENGINEERING)

Time: 3 Hours

Max. Marks: 60

Section – A (Short Answer type questions)

(10 Marks)

Answer All Questions

1. Define types of Frames.
2. Define the types of Arches.
3. Define the static and kinematic indeterminacy of beam.
4. A simply supported beam of length L carries a point load W at the centre. Find the deflection using energy theorem.
5. Write the effects of sinking supports
6. Draw BMD for Propped cantilever with point at centre.
7. Write clayron's theorem and explain terms.
8. Write assumptions in slope deflection method.
9. Draw I.L.D for the reaction at A for a simply supported beam AB.
10. Define ILD.

Course Outcome	B.T Level	Marks
CO1	L1	1M
CO1	L2	1M
CO2	L2	1M
CO2	L3	1M
CO3	L2	1M
CO3	L3	1M
CO4	L2	1M
CO4	L2	1M
CO5	L3	1M
CO5	L3	1M

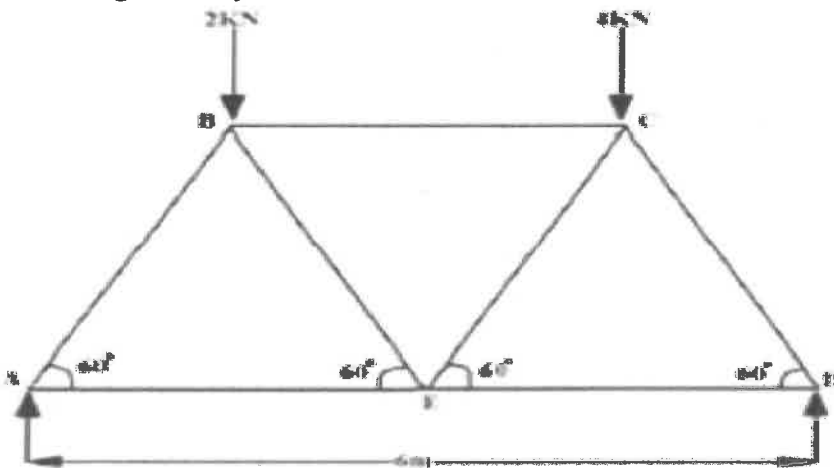
Section B (Essay Questions)

Answer all questions, each question carries equal marks.

(5 X 10M = 50M)

11. A) Determine the forces developed in the members of the truss shown fig. Use any method.

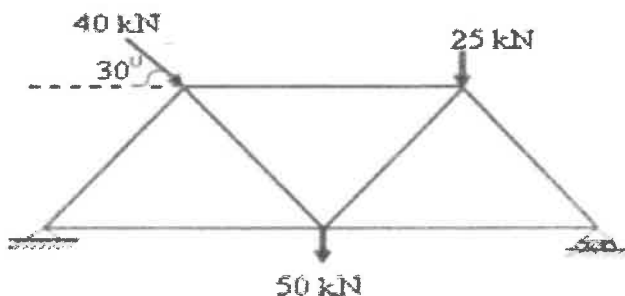
CO1 L3 10M



OR

- B) Determine the forces in all the members of the truss shown in figure by using method of joints.

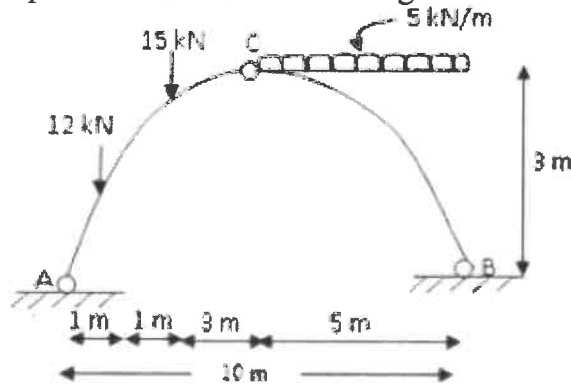
CO1 L3 10M



12. A) A Three hinged arch has a span of 30m and rise of 10 m. The arch carries udl of 0.6kN/m on the left half of the span. It also carries two concentrated load of 1.6kN & 1kN at 5m & 10m from right end. Determine Reactions at the supports. CO2 L2 10M

OR

- B) Calculate the reactions and Maximum Bending Moment for the given three hinged parabolic arch as shown in fig. CO2 10M

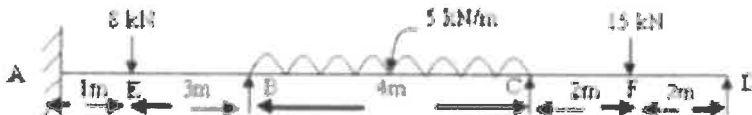


13. A) A cantilever ACB Of span 20M is fixed at A and propped at B acting two-point loads 4kN and 8kN at a distance of 5m and 8m from fixed support draw SFD and BMD. CO3 L2 10M

OR

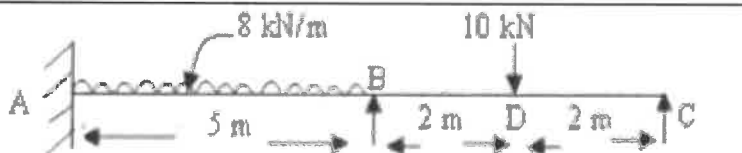
- B) A fixed beam of length 6 m carries a point load of 30kN at a distance of 2 m from left end. Determine the fixed end moments and deflection under the load. Take $EI = 1 \times 10^4 \text{ kNm}^2$. CO3 L2 10M

14. A) Draw BMD and SFD for the Continuous beam shown in fig. CO4 L3 10M



OR

- B) Draw BMD and SFD for the beam shown in fig by using slope deflection method. CO4 L3 10M



15. A) A uniform load of 2000N/m, 5 m long crosses a girder of 20m span from left to right. Calculate the maximum S.F and B.M at a section 8M from left support. CO5 L2 10M

OR

- B) Two-point loads of 5000N and 2000N spaced 3M a part cross a girder of 9 m span from left to right, with smaller loading leading. Draw the SF and BM diagrams. Find the position and amount of absolute maximum bending moment. CO5 L3 10M