

ANURAG Engineering College
(An Autonomous Institution)

II B.Tech II Semester Regular Examinations, June/July – 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. Determine kinematic indeterminacy for rigid jointed space truss if members are inextensible?
3. Define the static and kinematic indeterminacy of beam.
4. Define the types of Arches.
5. Write the effects of sinking supports.
6. Draw BMD for Propped cantilever with point load at centre.
7. Write clayron's theorem.
8. Draw I.L.D for the reaction at A for a simply supported beam AB.
9. Write assumptions in slope deflection method.
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

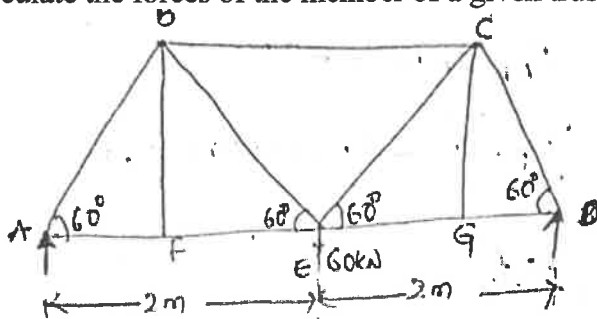
Section B (Essay Questions)

Answer all questions, each question carries equal marks.

(5 X 10M = 50M)

11. A) Calculate the forces of the member of a given truss.

CO1 L3 10M



OR

- B) Define Frame & types of frames in detail.
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.

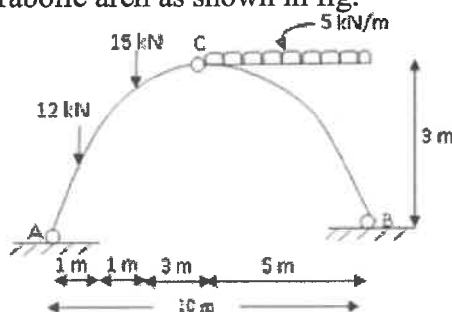
CO1 L3 10M

CO2 L2 10M

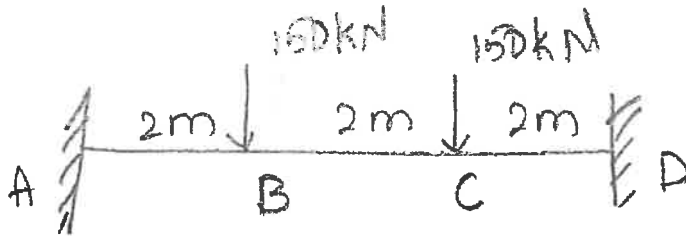
OR

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

CO2 L2 10M

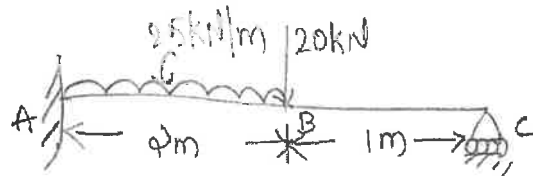


13. A) A fixed beam of span 6m is loaded with point loads of 150kN at 2m from each support. Draw the BMD & SFD. Find the max deflection take $E= 2 \times 10^5 \text{ KN/M}^2$, $I= 8 \times 10^8 \text{ mm}^4$ CO3 L2 10M



OR

- B) Analyse a propped cantilever beam as shown in the fig and draw the SF And BM diagrams. CO3 L2 10M



14. A) A continuous beam ABCD rests on four supports and the three spans are $AB=5\text{m}$ $BC=10\text{m}$ $CD=3\text{m}$. The udl loads are 3kN/m , 2kN/m , 4kN/m on AB, BC, CD respectively. Determine bending moments at the supports B & C and also plot the shear force & bending moment diagrams.

OR

- B) A continuous beam of ABC of uniform section is fixed at A and simply supported at B & C. The spans AB and BC are 4m, 3m respectively the beam carries a udl of 8kN/m throughout the span. Draw bending moment and shear force diagram.
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 apart 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