

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

II - B. Tech II-Semester Supplementary Examinations (BR23), Aug - 2025

STRUCTURAL ANALYSIS (CE)

Time: 3 hours

Max. Marks: 70

Question Paper consists of Part-A and Part-B

*Answer ALL the question in **Part-A and Part-B***

PART-A (10X2 = 20M)

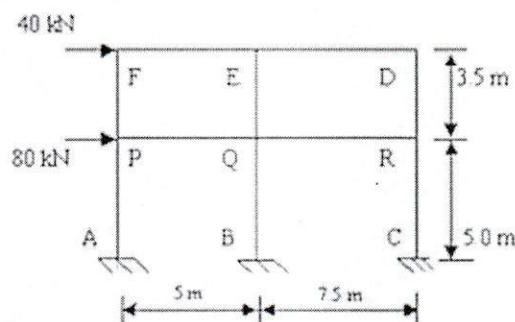
	Marks	CO	BL
1. a) Explain the terms Static Indeterminacy and Degree of Indeterminacy.	(2M)	CO1	BL2
b) Explain how lateral loads are developed on a structural frame?	(2M)	CO1	BL2
c) How fixed beams can be statically determinate?	(2M)	CO2	BL2
d) What is the moment generated when any support sinks by an amount of δ in any fixed beam of span L and flexural rigidity EI?	(2M)	CO2	BL3
e) Explain slope deflection method considering a continuous beam with three supports and with uniformly distributed load W/m.	(2M)	CO3	BL2
f) State two assumptions made in the analysis of Slope deflection method?	(2M)	CO3	BL2
g) Define and explain stiffness and distribution factor.	(2M)	CO4	BL2
h) Write the use of carryover factor in moment distribution method.	(2M)	CO4	BL2
i) When does the stiffness method is more suitable than flexibility method?	(2M)	CO5	BL2
j) What is Kani's method and what is the terminology used in Kani's method?	(2M)	CO5	BL2

PART-B (5X10 = 50M)

2. Discuss the difference between Portal method and Cantilever method with an example. 10(M) CO1 BL6

(OR)

3. Analyse the frame shown in figure by Portal method. 10(M) CO1 BL4



4. A continuous beam ABCD is simply supported over three spans. Span AB is 9m carrying an udl of 5kN/m, span BC is 14m carrying an udl of 5kN/m and span CD is 6m carrying an udl of 8kN/m. Find the moment over supports B and C. Draw S.F.D and B.M.D. 10(M) CO2 BL3

(OR)

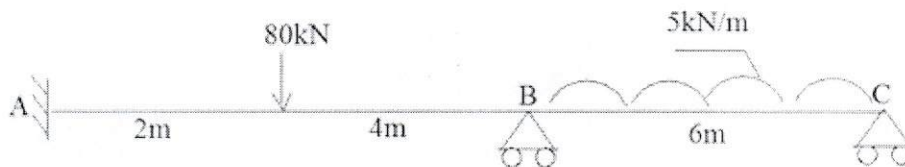
5. Derive the equation for a fixed beam with ends at different levels. 10(M) CO2 BL3

6. A continuous beam is built in at A and it is carried over rollers at B and C with spans of AB and BC being 10m. The beam carries a uniformly distributed load of 7.5kN/m over AB and a point load of 50kN over BC 2.5m from the support B, which sinks by 20mm. Values of E and I are $2 \times 10^5 \text{ N/mm}^2$ and $2 \times 10^9 \text{ mm}^4$. Calculate the support moments and draw bending moment diagram giving critical values. Use Slope deflection method. 10(M) CO3 BL3

(OR)

7. Analyse the portal frame by slope deflection method. Draw the bending moment diagram and sketch the deflected shape of the structure. The two columns of AB and CD of 4m height with I, Beam BC of span 4m, with 2I. The beam BC carries an udl of 10 kN/m. The supports at A and D are fixed. 10(M) CO3 BL4

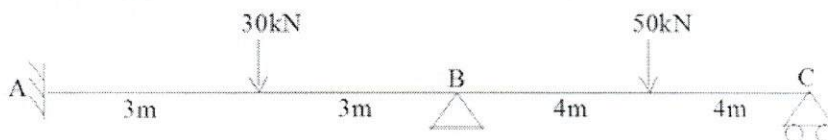
8. Analyse the continuous beam shown in fig. by moment distribution method. Assume down ward settlement at B and C are 10mm and 5mm respectively. And uniform flexural rigidity of beam AB and BC = $EI = 18 \times 10^{11} \text{ N-mm}^2$. 10(M) CO4 BL4



(OR)

9. Analyse the portal frame by moment distribution method. Draw the bending moment diagram and sketch the deflected shape of the structure. The two columns of AB and CD of 4m height with 2I, Beam BC of span 5m, with I. The beam BC carries an udl of 20 kN/m. The supports at A and D are fixed. 10(M) CO4 BL4

10. Analyse the continuous beam shown in fig. by Stiffness method. Assume uniform flexural rigidity of beam AB and BC = $EI = 12 \times 10^{11} \text{ N-mm}^2$. 10(M) CO5 BL4



(OR)

11. Analyse the frame shown in fig. by Kani's method 10(M) CO5 BL4

