

Roll No.

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech. (CE) (Sem.-5th)

STRUCTURAL ANALYSIS-II

Subject Code : CE-305

Paper ID : [A0614]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

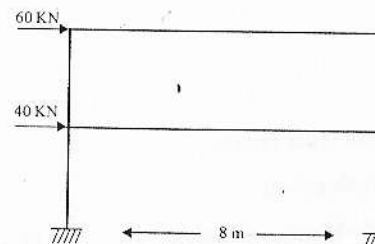
SECTION-A**I. Answer briefly :**

- (a) Distinguish between statically determinate and statically indeterminate structure.
- (b) "A continuous beam is always indeterminate". Give your comments.
- (c) A beam is fixed at ends A and B. It is subjected to a load of 12 kN at centre. What will be the fixing moments, the span of beam being 5 m ?
- (d) What is the difference between Portal Method and Cantilever Method ?
- (e) Define Distribution Factor.
- (f) Differentiate between absolute and relative stiffness.
- (g) What is an influence line ?
- (h) Draw diagram of any two space frames.
- (i) Differentiate between sway and non-sway frames.
- (j) What is rotation contribution factor ?

SECTION-B

2. A cantilever of 3 m span and carry a uniformly distributed load of 20 kN/m. The point C is at the free end. Draw Shear Force and B.M. diagram and find the reaction at C.
3. A three span continuous beam is built on rollers at B and C. $AB = BC = CD = 4$ m. A uniformly distributed load of 20 kN/m. is applied over the span AB. Analyse the beam using Slope Deflection Method. Sketch the B.M. & Shear Force Diagram.
4. A continuous beam ABCD with overhang of 2 m at A and hinged at B & C. It is subjected to a point load of 40 kN at centre of span AB ($AB = 4$ m), a uniformly distributed load of 20 kN/m over the span BC ($BC = 6$ m). B sinks by 10 mm. $E = 2 \times 10^4$ N/mm². Find the reactions and B.M. at supports.

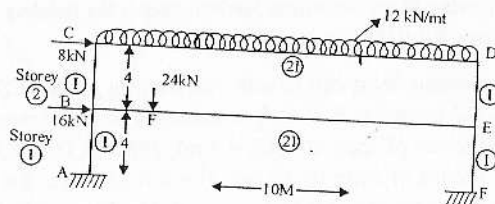
5. Analyse the frame using Cantilever Method.



6. It is required to draw influence line at B for a continuous beam ABC. $AB = BC = 4$ m. The beam is provided with a uniformly distributed load of 20 kN/m. $AB = 2EI$ of BC. The beam is provided with a uniformly distributed load of 20 kN/m. Find the reactions and B.M. at supports.

SECTION-C

7. A uniform beam ABCD is fixed at A and D. It is simply supported on B & C, initially at the same level. All spans are of 4 m in length. Support C sinks by 1.05 cm. Taking $I = 25000 \text{ cm}^4$, $E = 205 \text{ kN/mm}^2$. Analyse the beam using Clapeyron's Theorem. Draw S.F. and B.M. Diagrams. (10)
8. Using Kani's Rotation Contribution Method, analyse the frame shown as under :



BF = 2 m BE = 10 m
FE = 8 m
AB = 4 m
BC = 4 m

(10)

9. Write notes on :

- (a) Equilibrium conditions for space frames
(b) Method of Consistent Deformation
(c) Tension coefficient method for space frames.

(3 + 4 + 3)