Roll No. | | | | | | | | | | | | Total No. of Pages : 04

Total No. of Questions : 09

B.Tech. (CE) (Sem.–6th)

STRUCTURAL ANALYSIS-III

Subject Code : CE-312

Paper ID : [A0623]

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

1. **Write briefly :**

a) Find the degree of kinematic and static indeterminacy for the beam for general case of loading.

b) Explain the Maxwell reciprocal theorem.

c) What is the difference between rigid jointed plane frame and rigid jointed space frame with respect to indeterminacies?

d) Explain the suitability of force method for the analysis of trusses.

e) Find out the axial stiffness of cantilever steel beam having a span of 2 m and size of 20mm x 4 mm.

f) Differentiate between flexibility and stiffness of a structure.

g) Out of displacement method an
better for the analysis of rigid join

h) Differentiate between system coo
the element approach of structural

i) Find out forces developed in a pris
(without rotation) is given to its o

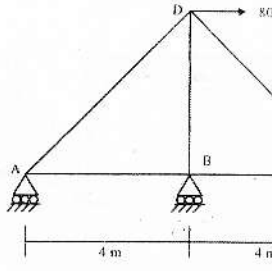
j) What is the difference between
element?

SECTION

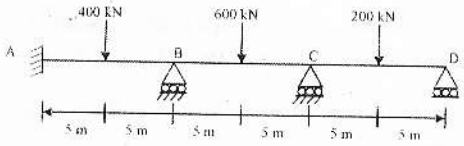
2. Find out the inverse of the following m

$$\begin{pmatrix} 30 & -10 & 0 \\ -10 & 15 & -5 \\ 0 & -5 & 5 \end{pmatrix}$$

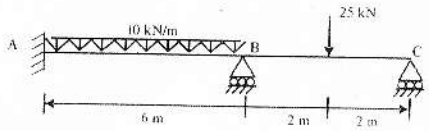
3. Compute the reaction at B and force
shown below. Assume E = 200 GPA
400 mm²; AD and CD have 600 mm²



4. Analyse the continuous beam shown below by using Flexibility Matrix method. Supports B and C settle by 3000/EI and 1500/EI respectively in kN-m units. Take EI Constant.



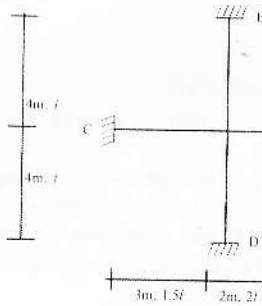
5. A horizontal beam ABC is fixed at A and simply supported over B and C as shown below. Analyse the beam using stiffness matrix method. The moment of inertia of whole beam is constant throughout.



6. A portal frame ABCD is fixed at A and D and has rigid joints at B and C. The frame is loaded as shown below. Develop the stiffness matrix and the frame using stiffness matrix approach and draw bending moment diagram.

SECTION-C

7. Analyse the frame shown below by usin draw bending moment diagram.



8. (a) Point out the situations in which Finite over other methods.

(b) Discuss various steps of finite element m

9. A portal frame ABCD is fixed at A and D C. The column AB is 5 m long and colun BC is of span 3 m and is loaded with a 8 kN/m. The moment of inertia of AB is 2 Analyze the frame using Displacement Trans

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