

Roll No.

Total No. of Pages : 03

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B.Tech. (Civil Engg.) (Sem.-6)
ADVANCED STRUCTURAL ANALYSIS

Subject Code : PECE-603C-18

M.Code : 79402

Date of Examination : 07-07-22

Time : 3 Hrs.

Max. Marks : 60

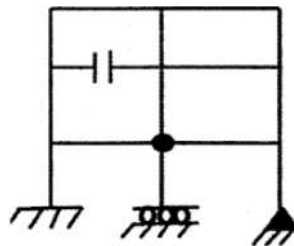
INSTRUCTIONS TO CANDIDATES :

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 have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Write the names of approximate methods of structural analysis and explain anyone.
- b) Define rotation contribution factor?
- c) What is the principle of virtual work?
- d) Explain Structural similitude.
- e) Differentiate between local and global coordinates.
- f) Define finite element and nodes.
- g) Establish the relationship between flexibility and stiffness matrices.
- h) Find out forces developed in a prismatic member when a unit translation (without rotation) is given to its one end and other end is hinged.
- i) Evaluate the kinematic indeterminacy and static indeterminacy of structure for general case of loading, shown in fig. 1.



j) What do you mean by Discretization Process.

SECTION-B

2. Derive the strain displacement relation for a 2 dimensional element.
3. Discuss briefly about substitute frame method.
4. Develop the flexibility matrix for the beam shown in fig. 2 with references to specified coordinates.

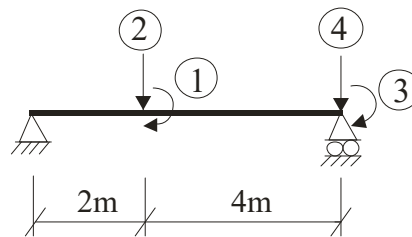


Fig.2

5. Develop stiffness matrix for the frame shown in fig. 3 by stiffness matrix method.

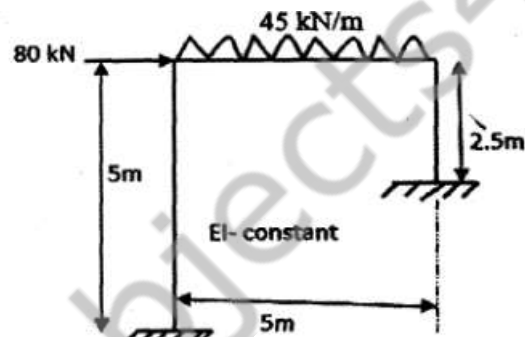


Fig.3

6. Point out the situations in which finite element method is preferred over other method.

SECTION-C

7. Using the portal method, analyze the building frame as shown in Fig. 4 Also, draw the BMD.

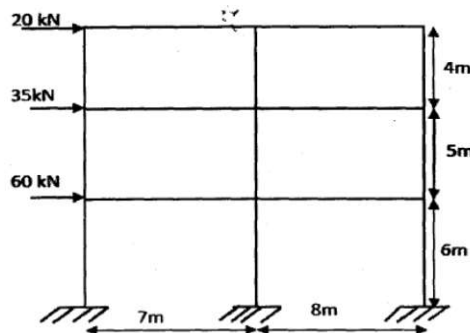


Fig.4

8. Analyze the continuous beam shown in fig. 5 by flexibility matrix method, treating support reactions at B and C as redundant. Take EI constant throughout. Also, draw the BMD.

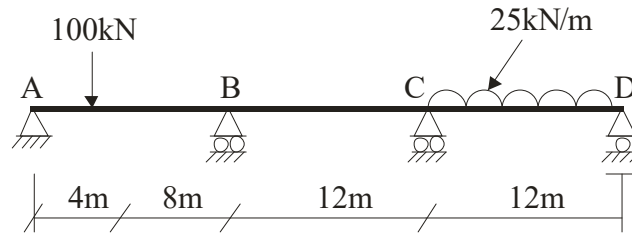


Fig.5

9. Write short note on following:
- Direct and indirect model analysis.
 - Differentiate between force transformation matrix and displacement transformation matrix.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.