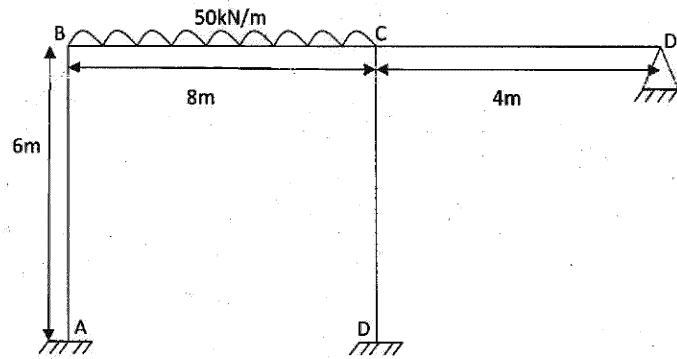


6. Using stiffness matrix method, analyses the frame shown in fig. Take EI constant throughout : 15



Unit IV

7. Write down the merits and demerits of transformation matrix approach of structural analysis. 15
8. Develop the displacement transformation matrix for the structures shown in Fig. and hence

No. of Printed Pages : 05

Roll No.

AA561

M. Tech. EXAMINATION, May 2019

(First Semester)

(B. Scheme) (Re-appear)

CE(SE)

CES501

ADVANCED STRUCTURAL ANALYSIS

Time : 3 Hours]

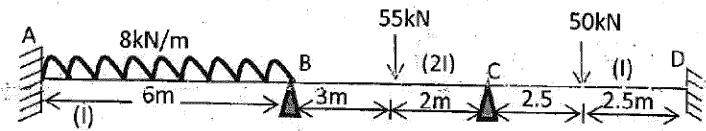
[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Assume any data if missing in the question paper.

Unit I

1. A continuous beam ABCD consists of three spans and is loaded as shown in fig. Ends A and D are fixed. Using the slope deflection method and determine the bending moment at the supports and plot the bending moment diagram. **15**



2. (a) List the properties of stiffness matrix. Also write down the difficulties with direct stiffness method of formulation.
(b) Write down the relationship between stiffness matrix and flexibility matrix. **15**

Unit II

3. A three span continuous beam ABCD rests on simple support at A and D and on elastic supports at B and C. $AB = BC = CD = L$.

A vertical downward load P acts at B. Calculate the supports reactions at B and C if the axial flexibility of the elastic supports is $L^3/6EI$, where EI is the flexural rigidity of the beam.

15

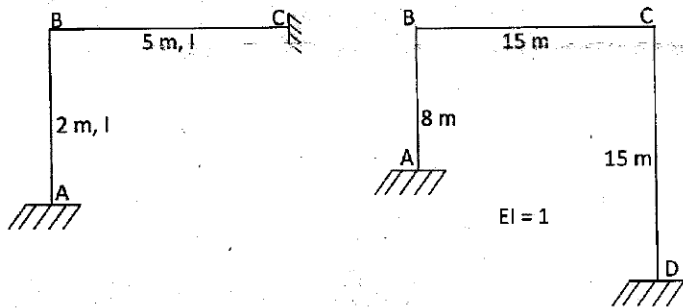
4. A cantilever beam AB of length 5 m is fixed at A and supported by elastic prob at B. The beam carries a uniformly distributed load of 4 kN/m. The stiffness of the prob is 1.8 kN/mm. Analyse the beam by displacement method. Hence determine the fixed end moment at A. Take $EI = 32000 \text{ kN.m}^2$. **15**

Unit III

5. For simply supported beam of uniform cross-section as shown, develop the flexibility matrix with reference to co-ordinate shown in fig. : **15**



derive the stiffness matrix. Assume EI constant
for all the members. **15**



derive the stiffness matrix. Assume EI constant
for all the members. **15**

