



ADAMAS UNIVERSITY
END-SEMESTER EXAMINATION : MAY 2021
(Academic Session: 2020 – 21)

Name of the Program:	B.Tech.	Semester:	VI
Paper Title :	Structural Analysis III	Paper Code:	ECE43104
Maximum Marks :	40	Time duration:	3 hrs.
Total No of questions:	8	Total No of Pages:	3
Instruction to the Candidate: 1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. 2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. 3. Assumptions made if any, should be stated clearly at the beginning of your answer.			

Answer all the Groups

Group A

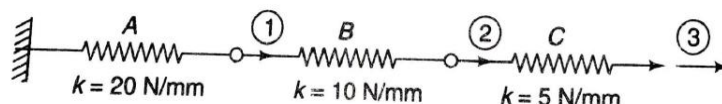
Answer all the questions of the following $5 \times 1 = 5$

1. a) What are the basic unknowns in Flexibility matrix method?
b) Define Stiffness coefficient.
c) What is the basic aim of the stiffness method?
d) What is the equilibrium condition used in the Stiffness matrix method?
e) Write a short note on Global stiffness matrix.

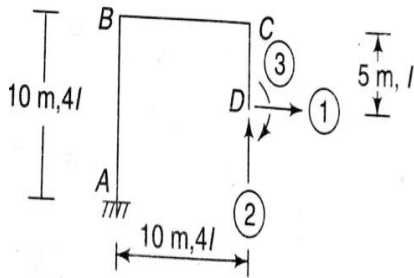
GROUP –B

Answer *any three* of the following $3 \times 5 = 15$

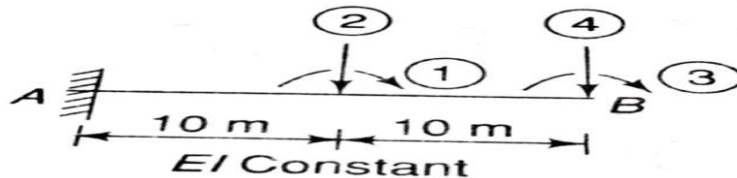
2. Three springs A, B, and C are connected in series as shown in figure below. Develop the flexibility matrix for the whole structure.



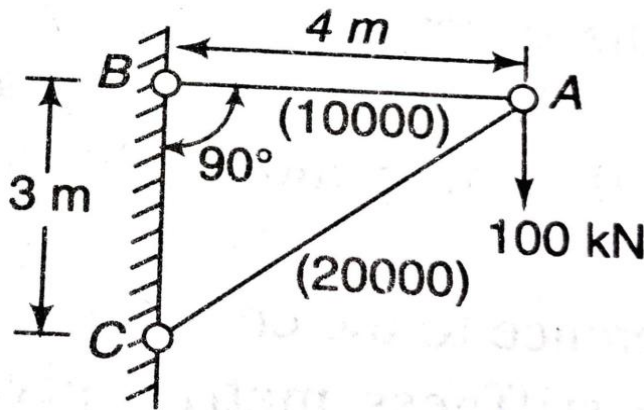
3. Develop the flexibility matrix with reference to coordinates 1, 2 and 3 of a rigid-jointed plane frame as shown in Figure below.



4. Develop the stiffness matrix for beam AB with reference to coordinates as shown in figure below.



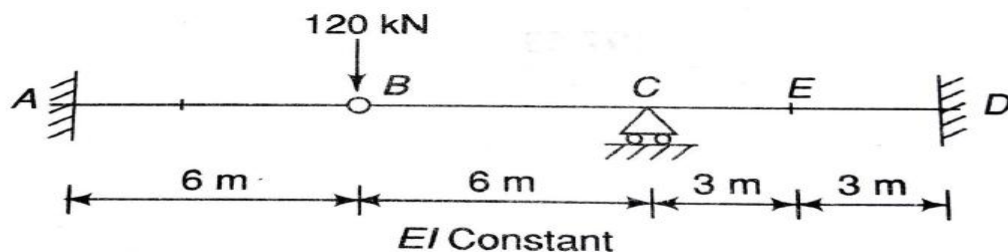
5. Determine the displacement at joint A of the truss shown in Figure below by stiffness matrix method. The numbers in parentheses are the cross-sectional area of the members in mm^2 . Take $E = 200 \text{ GPa}$.



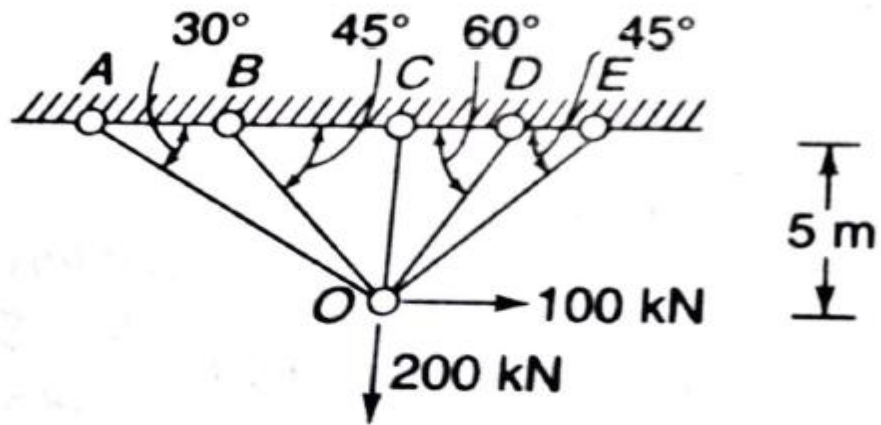
GROUP -C

Answer any two of the following $2 \times 10 = 20$

6. Analyse of the continuous beam ABCD as shown in figure below by Flexibility Method.



7. Analyse the pin-jointed plane frame as shown in figure below by Stiffness Method. The cross-sectional area of the each member is 2000 mm^2 . Take, $E = 200 \text{ kN/mm}^2$.



8. Analyse the frame shown in Fig. below by Cantilever method and evaluate approximately the column end moments, beam end moments, shears in beam and axial forces in column. Consider, sectional properties of all columns are same.

