Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) / (WP), S4 (PT) Exam April 2025 (2019 Scheme)

Course Code: CET302

Course Name: STRUCTURAL ANALYSIS-II

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1	Define (i) shape factor (ii) plastic moment capacity	(3)
2	What are the advantages and disadvantages of approximate method of analysis.	(3)
3	What are the assumptions made in the cantilever method of analysis ?	(3)
4	Describe flexibility method of matrix analysis	(3)
5	List the properties of element stiffness matrix?	(3)
6	Write a note on displacement transformation matrix.	(3)
7	Illustrate with the help of a diagram, the rotation of axes in two dimension	(3)
8	What is direct stiffness method.	(3)
9	Discuss about degree of freedom in structural dynamics.	(3)
10	Differentiate between damped and undamped vibration.	(3)

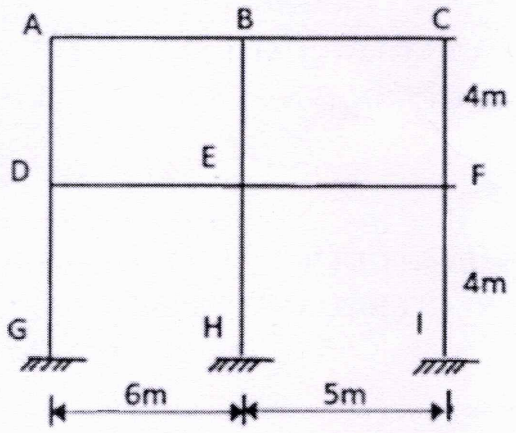
PART B

Answer one full question from each module, each carries 14 marks.

Module I

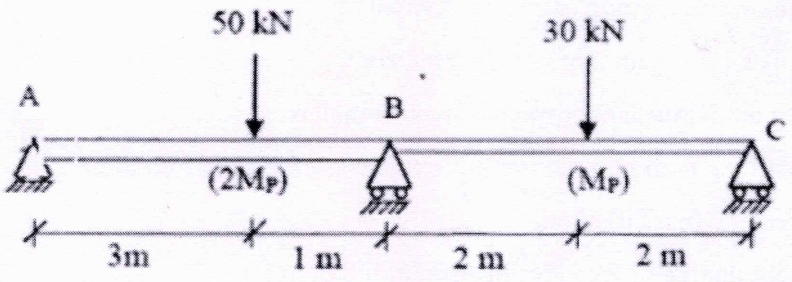
11	a)	A frame of a multi-storeyed building is shown in figure. Total dead load is 30kN/m and total live load is 25kN/m. Flexural rigidity EI is same for all members. Analyse the frame shown below for mid span negative moment on span DE, using substitute frame method.	(14)

80



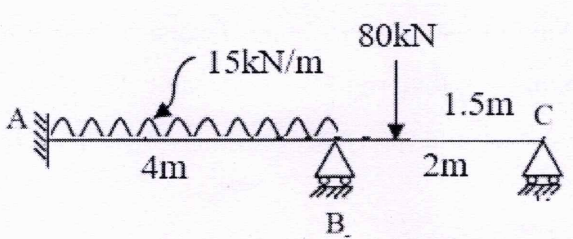
OR

12 a) Determine the plastic moment capacity Mp for the continuous beam shown in fig. below. Take load factor = 1.5 (14)



Module II

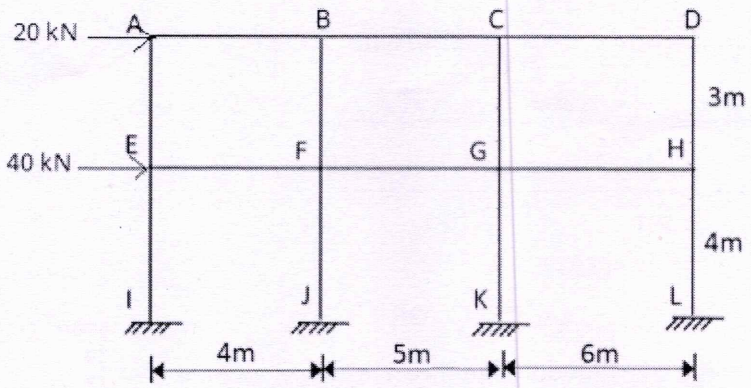
13 a) Analyse the continuous beam shown in figure below by flexibility method and draw the BMD. (14)



OR

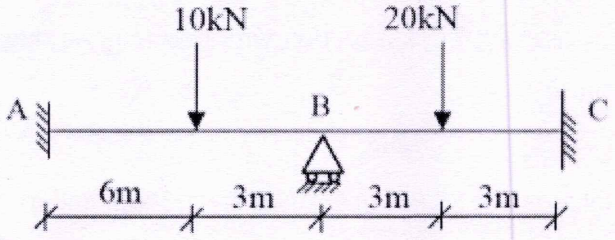
14 a) Define flexibility influence coefficient and stiffness influence coefficient (4)

b) Determine the axial force at the top storey of the frame shown in fig by cantilever method. Take cross sectional area of middle columns as '2a' and exterior columns as 'a' (10)



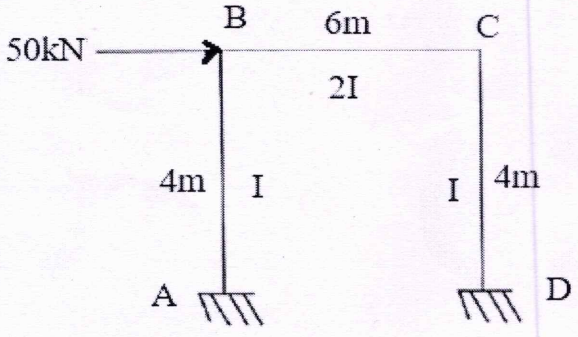
Module III

15 a) Analyse the continuous beam shown in figure by stiffness method. Flexural rigidity EI is constant throughout the beam. (14)



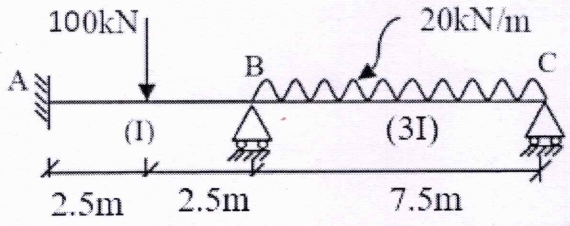
OR

16 a) Analyse the frame shown below using stiffness method and draw the BMD (14)



Module IV

17 a) Analyse the continuous beam shown in figure by direct stiffness method and draw the Bending moment diagram. (14)



OR

18 a) Explain briefly the steps involved in direct stiffness method (8)

b) How element stiffness matrix in global coordinates is derived from the local coordinate system for a truss element? (6)

Module V

19 a) Derive an expression for response of SDOF system subjected to damped free vibration (underdamped case only) in x direction with mass 'm', spring constant 'k' and damping constant 'c'. (14)

OR

20 a) For a single degree of freedom system, if m = 20 kg, k = 15N/m and c= 8 Ns/m, find the damping factor, logarithmic decrement and ratio of any two successive amplitudes. (8)

b) Define logarithmic decrement (6)

****