A **1200CET302012403** **Pages: 5**

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S4 (PT) (S,FE) Examination December 2024 (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	Explain the term collapse load of a structure.	(3)
2	Discuss any three advantages of approximate method of structural analysis.	(3)
3	Distinguish between static indeterminacy and kinematic indeterminacy with examples.	(3)
4	Explain the term Equivalent joint load.	(3)
5	Differentiate force method and displacement method of analysis.	(3)
6	Explain the features of stiffness matrix.	(3)
7	Discuss the general procedure in stiffness method to analyse pin-jointed frames considering temperature effect.	(3)
8	How is direct stiffness matrix method different from stiffness method of analysis?	(3)
9	Define Degree of Freedom (DOF) in a dynamic system.	(3)
10	Write down the basic difference between static loading and dynamic loading	(3)

PART B

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

Module I

11	a)	Define shape factor. Derive an expression for shape factor for rectangular cross section of width b and depth D.	(4)
	b)	Determine the Plastic moment M_p required in the continuous beam shown in Fig.1 so as to ensure a minimum load factor =1.7	(10)

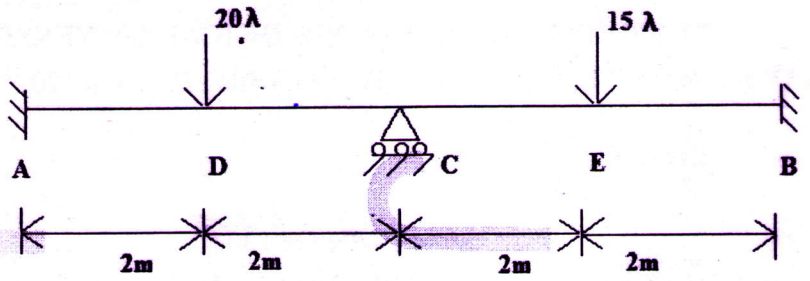

Fig.1

OR

12 Analyse the given frame of a multi storied building, which is spaced at 3.5m interval. Dead load and Live load are 3kN/m^2 and 5kN/m^2 respectively. Self-weight of beam with 4m span is 4kN/m and that of 6m span is 5kN/m. Determine the maximum bending moment at the support B. (14)

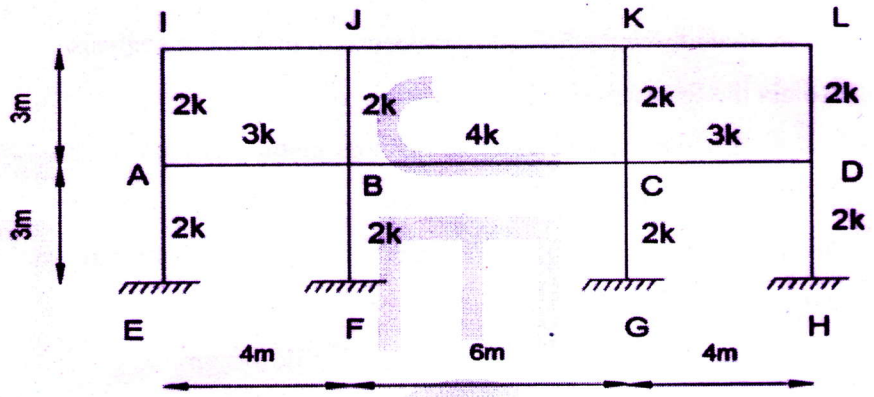

Fig.2

Module II

13 a) List the assumptions in cantilever method of analysis. (2)

b) Analyse the frame shown in Fig.3 below using cantilever method and draw BMD also. (12)

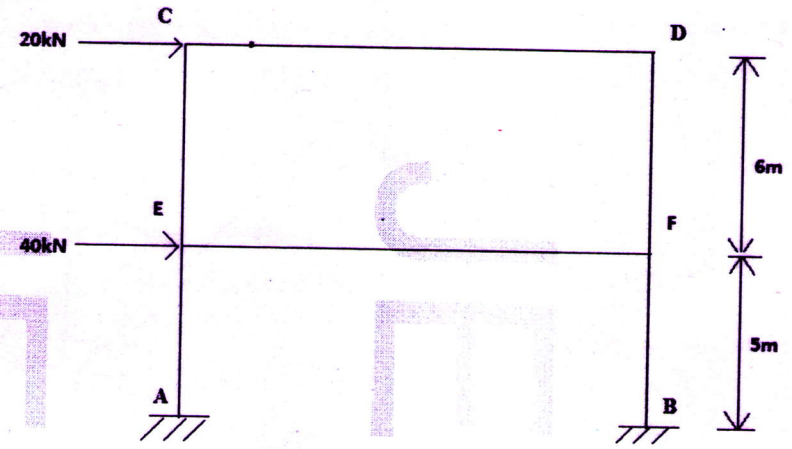

Fig.3

OR

14 Analyse the beam shown in Fig.4 using flexibility method. (14)

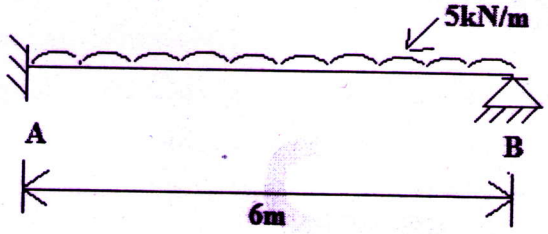

Fig.4

Module III

15 Analyse the continuous beam shown in Fig. 5 using stiffness method. Draw BMD also. Assume EI as constant throughout. (14)

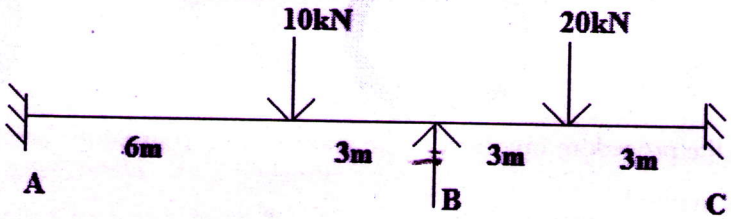

Fig. 5

OR

16 Determine the member forces in the truss shown in Fig.6 using stiffness method. Take AE/L=1 for all the members. (14)

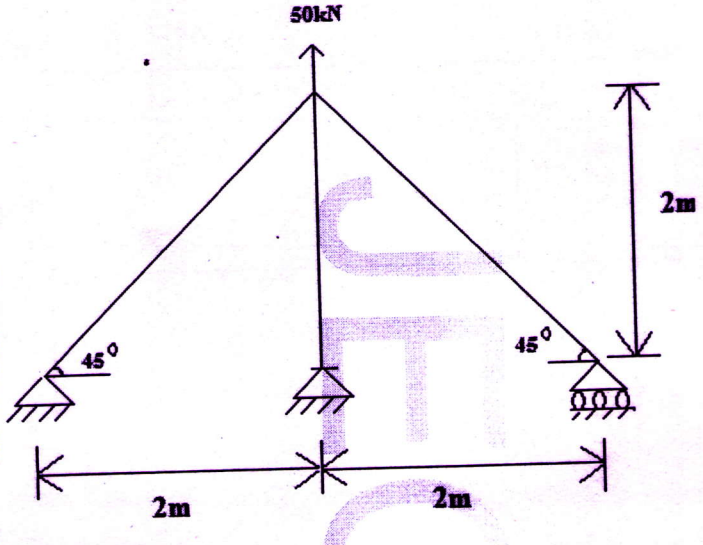

Fig. 6

Module IV

17 a) Derive the global stiffness matrix for the frame shown in Fig.7 by direct stiffness method. (6)

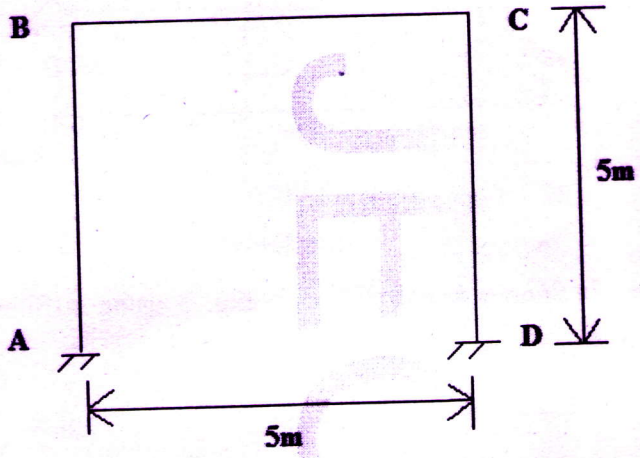

Fig. 7

b) Discuss the procedure involved in the analysis of a continuous beam using direct stiffness method. (8)

OR

18 Determine the end moments of a frame shown in Fig.8 using direct stiffness method and draw BMD. (14)

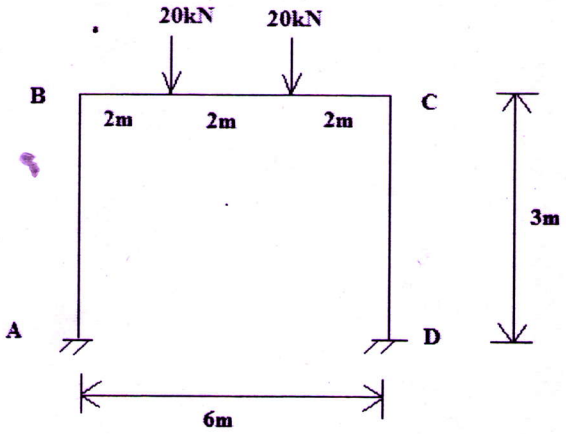

Fig. 8

Module V

19 a) Explain the various components in the analytical model of a SDOF system. (4)

b) Derive an expression for response of SDOF system subjected to damped free vibration in x direction with mass 'm', spring constant 'k' and damping constant 'c'. Also draw the response diagram. (10)

OR

20 a) Explain logarithmic decrement. Derive the equation to determine logarithmic decrement. (6)

b) Determine the natural frequency of the system shown in Fig,9 consisting of a weight of 50N attached to a cantilever through a coil spring, K=20N/m. The cantilever cross section is 200mm x300mm, young's modulus of elasticity E=2.5x104MPa. (8)

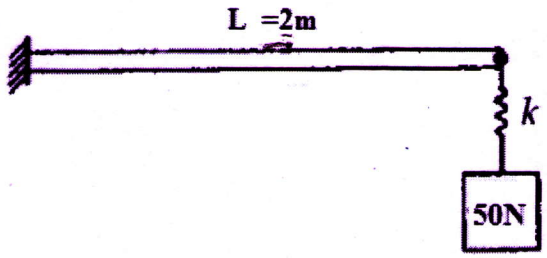

Fig.9

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