

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (R) (FT/WP) Examination November 2025 (2024 Scheme)

Course Code: PCCET303**Course Name: STRUCTURAL ANALYSIS - I**

Max. Marks: 60

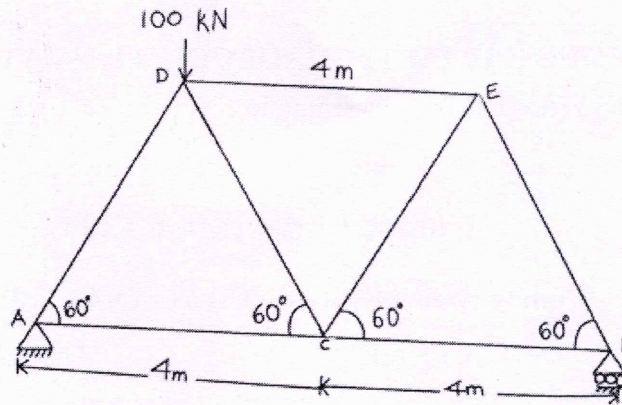
Duration: 2hours30minutes

PART A*(Answer all questions. Each question carries 3 marks)*

		CO	Marks
1	Differentiate determinate and indeterminate structures	1	(3)
2	Derive the expression to find the length of cable if the supports are at same level	1	(3)
3	State and explain Betti's Theorem	2	(3)
4	Define virtual work. Explain principle of virtual work.	2	(3)
5	State Castigliano's Theorems	2	(3)
6	Explain the concept of effect of prestrain.	1	(3)
7	State and explain Eddy's Theorem	1	(3)
8	Differentiate between ILD for Bending Moment and Bending Moment Diagram of a simply supported beam	4	(3)

PART B*(Answer any one full question from each module, each question carries 9 marks)***Module -1**

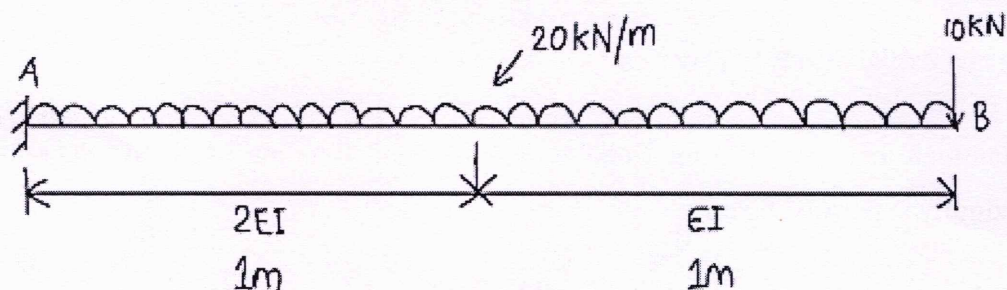
- 9 a) Determine the forces in all the members and tabulate the values for the pin jointed truss shown below. 1 (9)



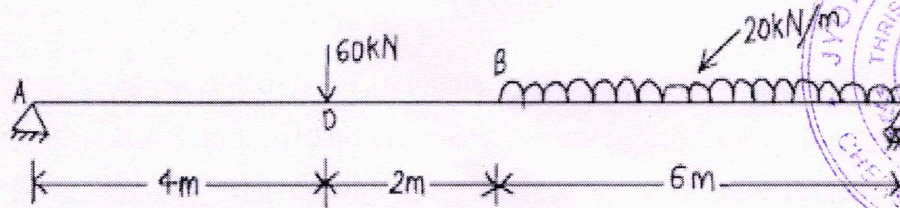
- 10 a) A suspension cable has a span of 160m and central dip of 16m. it carries a UDL of 5 kN/m of horizontal length. Calculate the maximum and minimum tension in cable. Find the horizontal and vertical forces in each pier if the cable passes through frictionless pulley on the top of pier, the back stay is inclined at 30° with horizontal. Also determine the maximum BM in the pier if the height of pier is 15m. 1 (9)

Module -2

- 11 a) By using conjugate beam method determine the slope and deflection at the free end of the cantilever beam shown in figure. 2 (9)

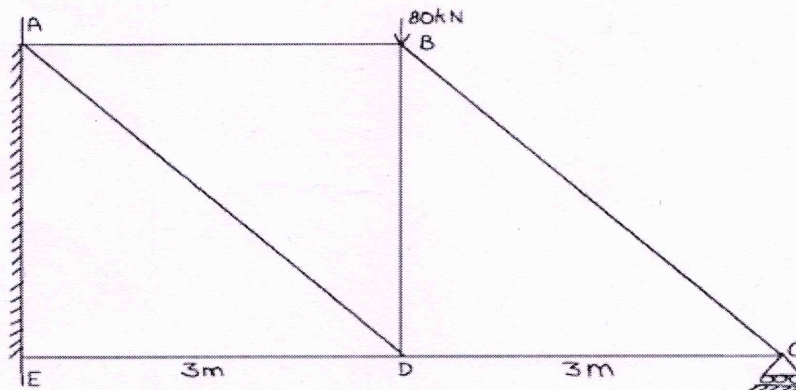


- 12 a) By unit load method determine the vertical deflection at B for the beam shown in figure. EI is constant throughout. 2 (9)

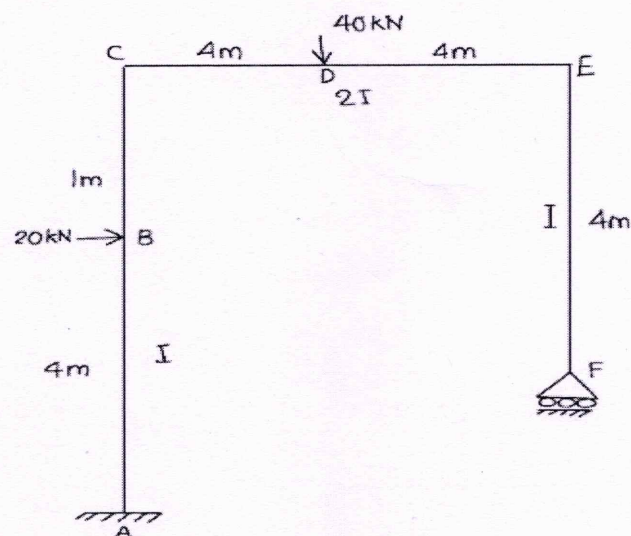


Module -3

- 13 a) By consistent deformation method determine the support reaction at C for the truss shown below. AE is 3m. Assume cross sectional area and E of all members are same. 3 (9)



- 14 a) By Method of Consistent Deformation determine the support reaction at F of the frame shown in fig. 3 (9)



Module -4

- 15 a) A three hinged parabolic arch hinged at the supports and at the crown has a span of 24m and a central rise of 4m. It carries a concentrated load of 50kN at 18 m from the left support and a udl of 30kN/m over the left half. Determine the bending moment, normal thrust and radial shear at 6 m from the left support. 1 (9)
- 16 a) A uniformly distributed load 50kN/m and 4m long traverses a simply supported beam AB of span 15m from left to right. Draw the influence line diagram for shear force and bending moment at a section 6m from A. Calculate the maximum shear force and bending moment at this section. 4 (9)
