

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017**

**Course Code: CE202**  
**Course Name: STRUCTURAL ANALYSIS – I (CE)**

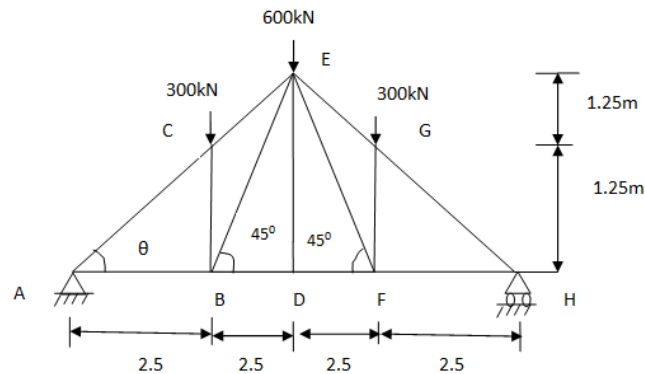
Max. Marks: 100

Duration: 3 Hours

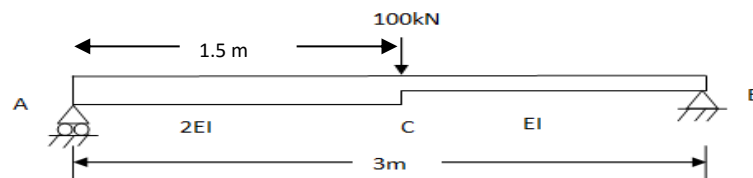
**PART A**

*Answer any two full questions. Each question carries 15 marks.*

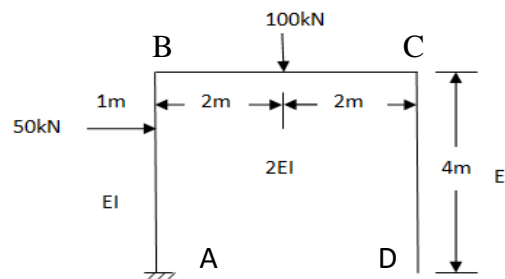
- 1 a) Explain the method of sections. (5)  
 b) Analyse the pin jointed truss as shown by the method of joints. (10)



- 2 a) Explain Maxwell's law of reciprocal deflection. (5)  
 b) Find the deflection at C of the beam as shown in figure by strain energy method. (10)



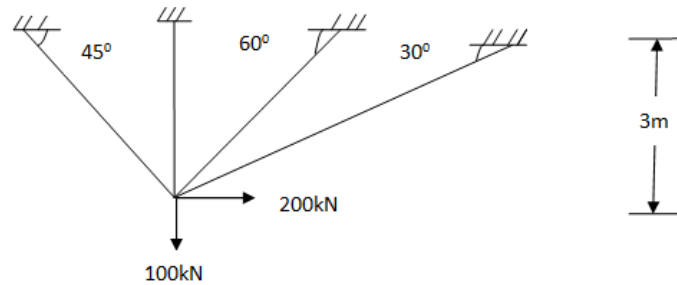
- 3 a) Differentiate between static and kinematic indeterminacy with examples. (5)  
 b) Find the vertical deflection at the free end of the frame loaded as shown by unit load method. (10)



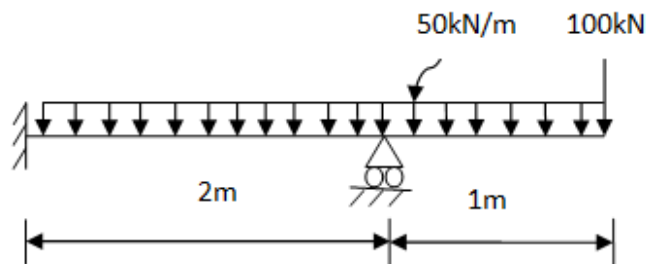
**PART B**

*Answer any two full questions. Each question carries 15 marks.*

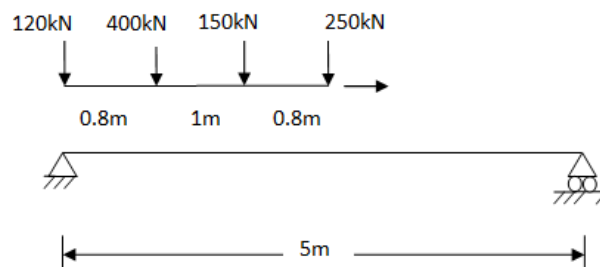
- 4 a) How will you account the effect of lack of fit and temperature changes in the analysis of trusses? (5)  
 b) Analyse the single jointed truss as shown in figure by the method of consistent deformation. AE is constant for all the members. (10)



- 5 a) What do you mean by influence line diagram? What are the uses of influence line diagrams? (5)  
 b) Analyse the propped cantilever by consistent deformation method. EI constant. (10)



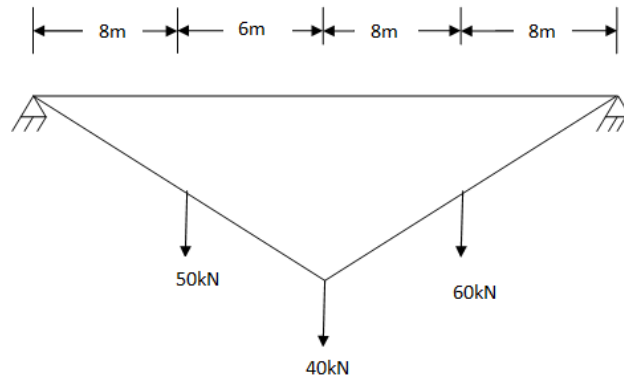
- 6 a) Draw the influence line diagram for shear force at any section of an overhanging beam of span 'L' with equal overhang on each side. (3)  
 b) For the simply supported beam AB of span 5m subjected to a train of concentrated loads moving from left to right as shown in Figure. Using influence lines find the absolute maximum bending moment and the equivalent uniformly distributed load. (12)

**PART C**

*Answer any two full questions. Each question carries 20 marks*

- 7 a) Write sheet notes on suspension bridges. (3)  
 b) Show that a cable subjected to uniformly distributed load  $w$ /unit horizontal length the shape of the cable is a parabolic. (5)

- c) A light cable is supported at two points 30m apart which are at the same level. The cable supports three concentrated loads as shown. The deflection at first point is 1m. Determine the tension in the different segments and total length of the cable. (12)



- 8 a) State Eddy's theorem. (3)
- b) What are the advantages of arches? (5)
- c) Draw the bending moment diagram for a three-hinged symmetric parabolic arch of span 50m rise 10m subjected to a concentrated load of 50 kN acting at 8m from left support and a uniformly distributed load of 25 kN/m acting over the right half portion. (12)
- 9 a) Show that the parabolic shape is a funicular shape for a three-hinged arch subjected to UDL for the entire span. (6)
- b) Draw the influence lines for horizontal thrust 'H', Moment at any section and radial shear for a three-hinged arch of span L and rise 'h'. (14)

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