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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)
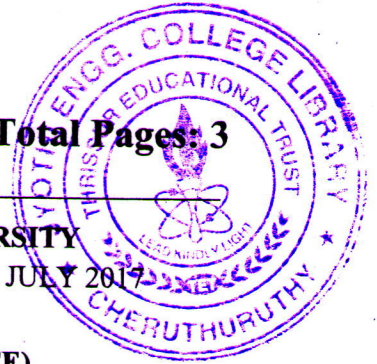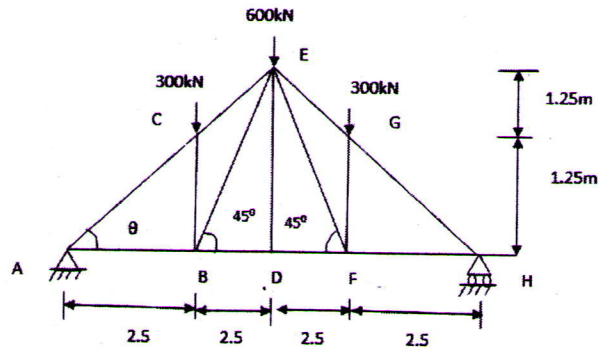
Max. Marks: 100   Duration: 3 Hours
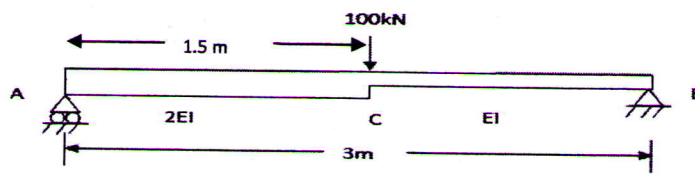
PART A
Answer any two full questions. Each question carries 15 marks.

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   (10)
   load method.
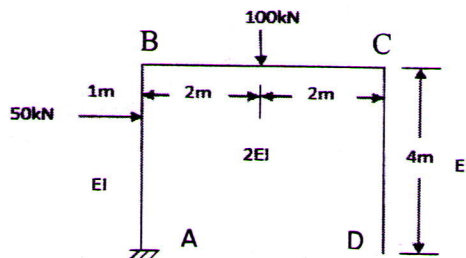
PART B
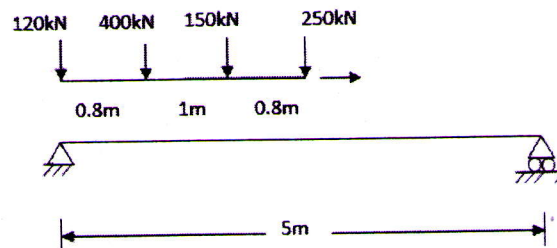### *Answer any two full questions. Each question carries 15 marks.*

4   a)   How will you account the effect of lack of fit and temperature changes in the   (5)
analysis of trusses?

     b)   Analyse the single jointed truss as shown in figure by the method of consistent   (10)
deformation.   AE is constant for all the members.
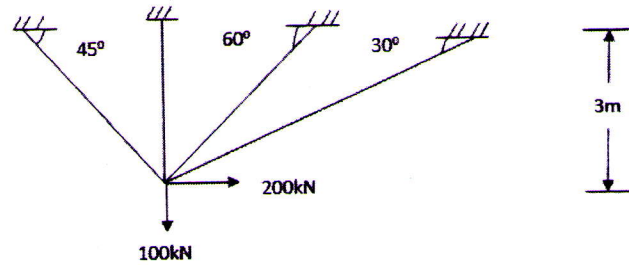
5   a)   What do you meant by influence line diagram? What are the uses of influence   (5)
line diagrams?

     b)   Analyse the propped cantilever by consistent deformation method. EI constant.   (10)
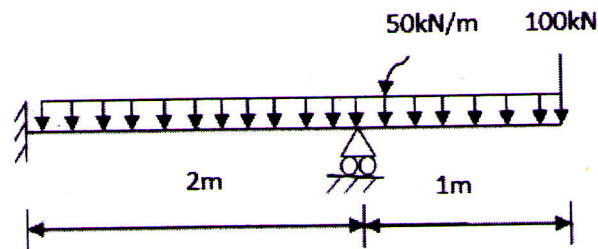
6   a)   Draw the influence line diagram for shear force at any section of an overhanging   (3)
beam of span 'L' with equal overhang on each side.

     b)   For the simply supported beam AB of span 5m subjected to a train of concentrated   (12)
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.


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   (5)
the shape of the cable is a parabolic.

c) A light cable is supported at two points 30m apart which are at the same level. The (12)
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.
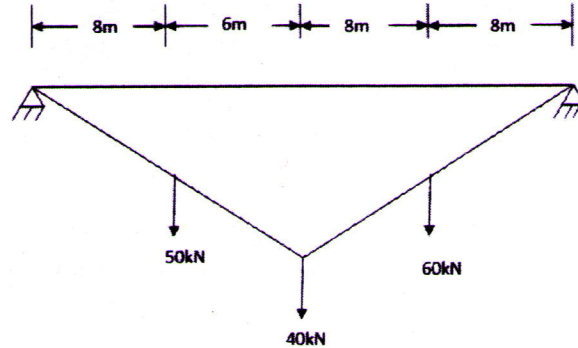
8 a) State Eddy's theorem. (3)

b) What are the advantages of arches? (5)

c) Draw the bending moment diagram for a three-hinged symmetric parabolic arch of (12)
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.

9 a) Show that the parabolic shape is a funicular shape for a three-hinged arch (6)
subjected to UDL for the entire span.

b) Draw the influence lines for horizontal thrust 'H', Moment at any section and radial (14)
shear for a three-hinged arch of span L and rise 'h'.

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