Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CE202

Course Name: STRUCTURAL ANALYSIS – I (CE)

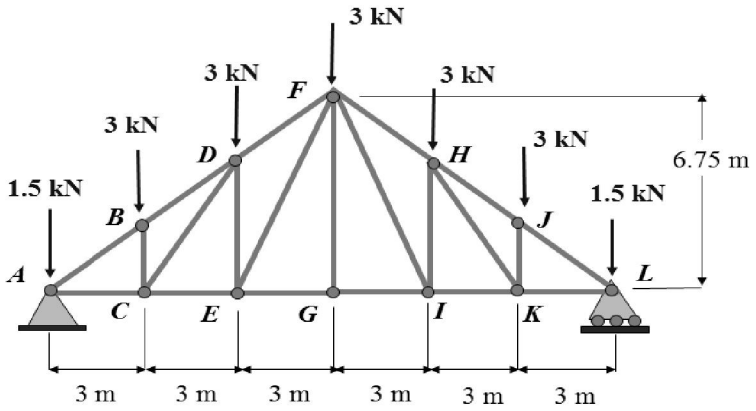
Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

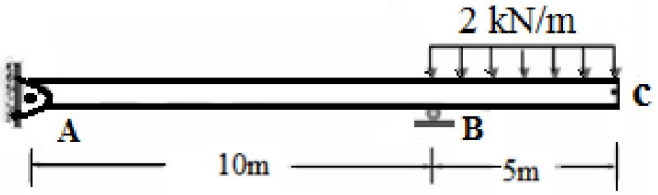
1 a) State the assumptions made in the analysis of plane trusses. (3)

b) A Pratt roof truss is loaded as shown. Using the method of sections, determine the forces in members *FH* and *GI*. (12)



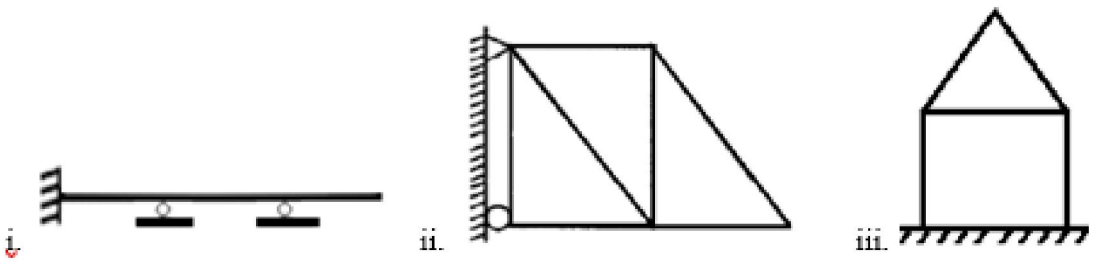
2 a) Obtain the expression for strain energy due to bending in a flexural member. (3)

b) Determine the vertical deflection at *C* using unit load method. Assume EI constant. (12)



3 a) State and prove Maxwell's law of reciprocal deflections. (6)

b) Determine the static and kinematic indeterminacies of the structures shown. (9)

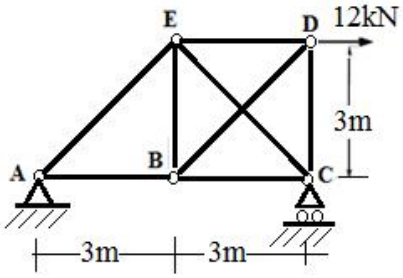


PART B

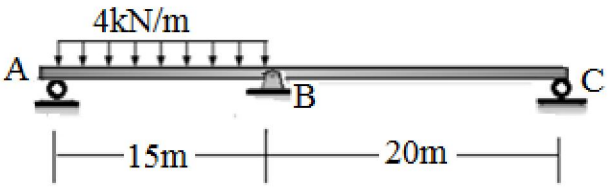
Answer any two full questions, each carries 15 marks.

4 Determine the force in the member BE. Axial rigidity AE of all members is (15)

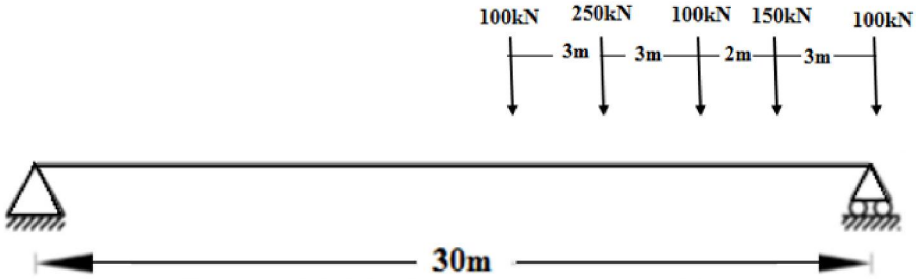
constant.



5 Analyse the beam shown using consistent deformation method and draw the SFD and BMD (15)



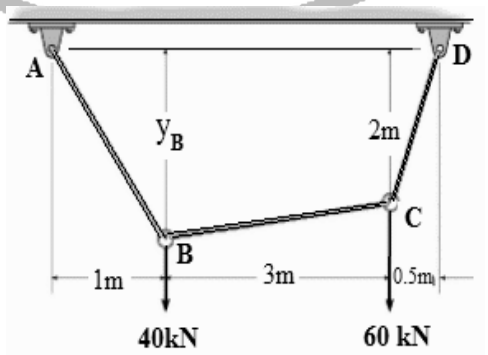
6 Compute the absolute maximum bending moment for the beam having span of 30 m and loaded with a series of concentrated loads moving across the span as shown in Figure. (15)



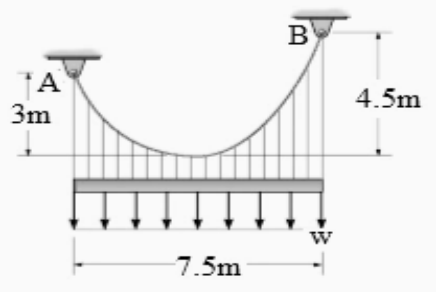
PART C

Answer any two full questions, each carries 20 marks.

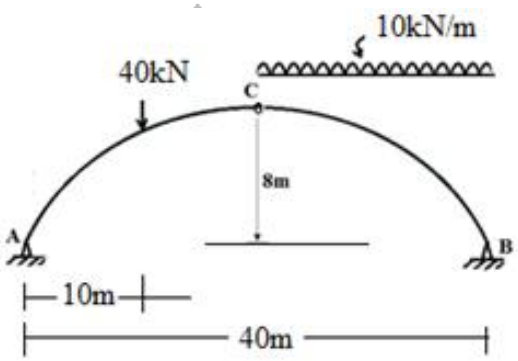
7 a) Cable ABCD supports the loading shown. Determine the maximum tension in the cable and sag of point B. (10)



b) The cable supports the uniform load of w=8kN/m. Determine the tension in the cable at each support A and B. (10)



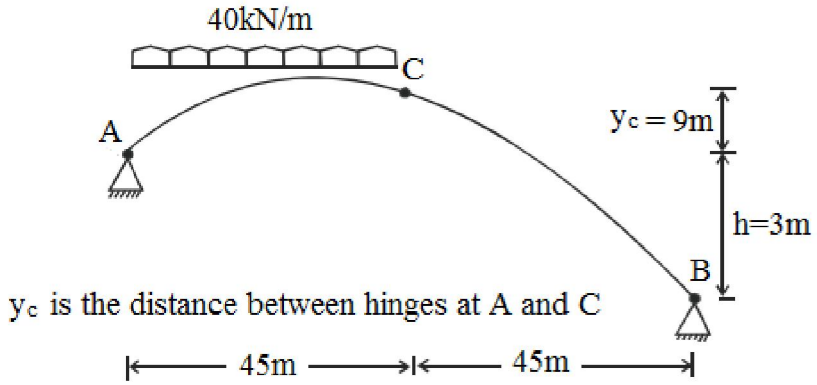
8 a) A three-hinged parabolic arch is loaded as shown in figure. Calculate the location and magnitude of maximum bending moment in the arch. Draw bending moment diagram. (15)



b) State Eddy's theorem. (5)

9 a) A three-hinged symmetric parabolic arch has a horizontal span *L* and central rise *h*. It is subjected to a uniformly distributed load of ***w*** per unit length along the span. Show that the shear force and bending moment at any section normal to the profile of arch is zero. Find also the normal thrust at this section. (6)

b) Analyse the three-hinged parabolic loaded arch with supports at different levels as shown. (14)



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