Karunya University
(Karunya Institute of Technology and Sciences)
(Declared as Deemed to be University under Sec.3 of the UGC Act, 1965)

End Semester Examinations - 2015-16 Even Semester - May 2016

14CE2030 Advanced Structural Analysis

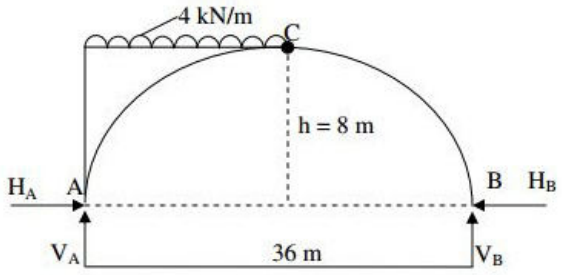
Set A

Time : 3 hrs
Total Marks: 100

1. A three hinged circular arch of span 16 m and rise 4 m is subjected to two point loads of 100kN and 80kN at the left and right quarter span points respectively. Find the reactions at the supports. Find also the bending moment, radial shear and normal thrust at 6 m from left support.

OR

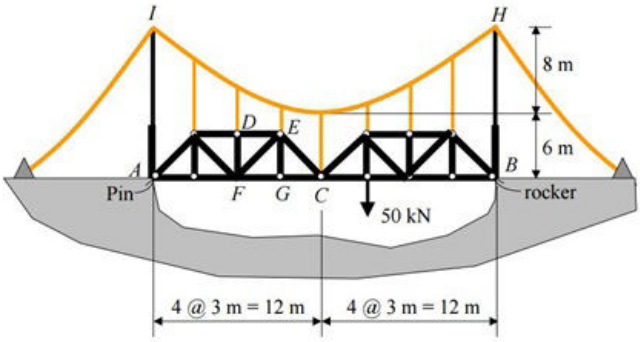
2. A UDL of 4kN/m covers left half span of 3-hinged parabolic arch of span 36m and central rise 8m. Determine the horizontal thrust also find (i) BM (ii) Shear force (iii) Normal thrust (iv) Radial shear at the loaded quarter point. Sketch BMD.



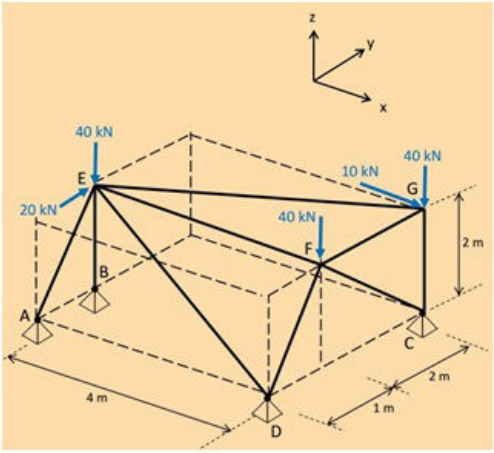
3. A suspension cable of uniform material is hung between 2 points A & B separated by a horizontal distance of 92m and carries a UDL of 25 kN/m. The maximum dip of the cable measured from points A and B are 8m and 4m respectively. Determine the horizontal component of tension in the cable. Also determine the length of the cable required. Neglect the self-weight of the cable.

OR

4. The suspension bridge in the figure below is constructed using the two stiffening trusses that are pin connected at their ends C and supported by a pin at A and a rocker at B. Determine the maximum tension in the cable IH. The cable has a parabolic shape and the bridge is subjected to the single load of 50 kN.

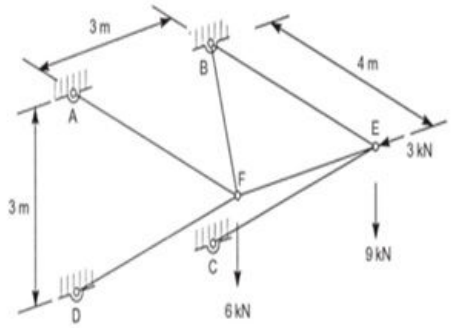


5. Analyze the space truss shown in figure and determine the forces in the member of the truss.

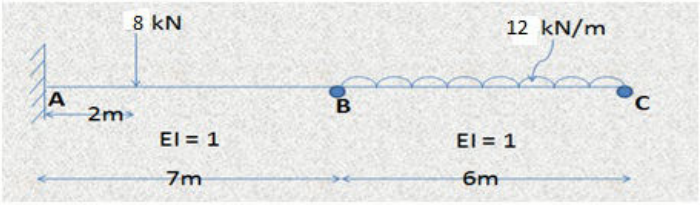


OR

6. A pin-jointed truss is attached to a vertical wall at points A, B, C and D. The members BE, BF, EF and AF are in the same horizontal plane. The truss supports vertically downward loads of 9kN and 6kN at E and F respectively and a horizontal load of 3kN at E in the direction EF. Calculate the forces in the members of the truss using tension coefficient method.

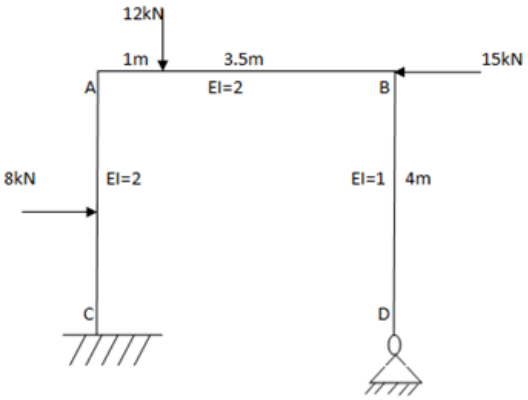


7. Analyse the continuous beam using Matrix Flexibility method.

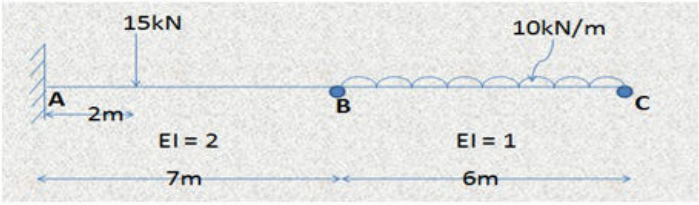


OR

8. Analyse the frame using Matrix Flexibility method.



9. Analyse the continuous beam using Matrix Stiffness method.



Wishing you All the Best