Code :CE05530 **RA**

III B.Tech II Semester(R05) Supplementary Examinations, April/May 2011
STRUCTURAL ANALYSIS-II
(Civil Engineering)
(For students of RR regulation readmitted to III B.Tech II Semester R05)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks
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1. A segmental arch of horizontal span 25m and central rise 5m is hinged at the springings and crown. It carries a point load of 100 kN at a distance of 6m from the left support hinge. Calculate the reactions at the supports and crown. Find the B.M., radial shear and normal thrust at 5m from the left support.

2. (a) What is the statical indeterminacy of three-hinged, two-hinged and fixed arches?
   (b) Derive the expression for evaluating the horizontal thrust in a two-hinged arch.
   (c) What happens if I = I_o sec θ?

3. (a) Obtain an expression to find the length of a cable, carrying u.d.l of "w" per unit length supported from two points distance "l" apart not at the same level, the lowest point being h_1 below left support and h_2 below right support.
   (b) What will be the horizontal support reactions?

4. Analyse a two-span continuous beam ABC having the end supports A and C fixed and spans AB = 4m and BC = 6m. On AB there is a u.d.l. of 10 kN/m while on BC there is a point load of 30kN at 2m from C. The moment of inertia of BC is twice that of AB. Sketch the B.M. and S.F.D.

5. Find the support moments of the continuous beam loaded as shown in Figure 5 using slope-deflection method. During loading the support B sinks by 10mm. Sketch the B.M.D. Take E = 200 × 10^6 kN/m^2 and I = 100 × 10^{-6} m^4.

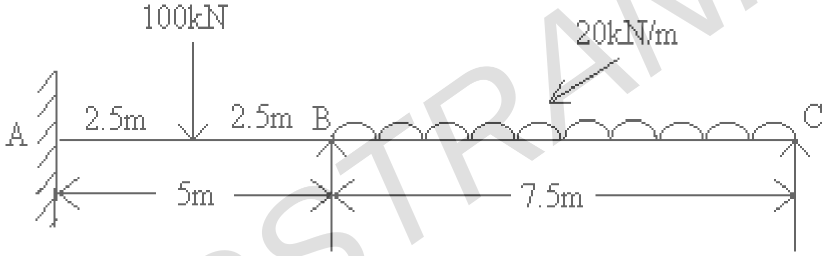

Figure 5

6. During loading the middle support B of the continuous beam ABC, sinks by 10mm. The ends A and C as fixed as shown in Figure 6 Find the moments at A,B, C using moment distribution method. Sketch the B.M. and S.F. diagram (E =200 GN/m^2 and I = 80 x 10^{-6} m^4).

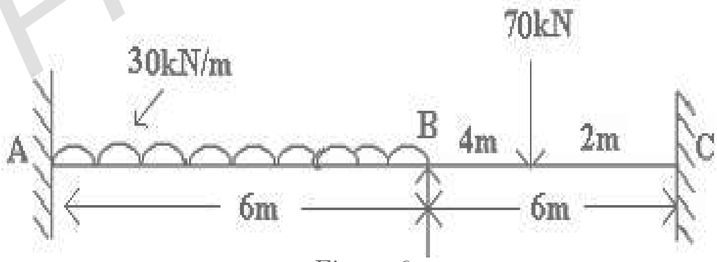

Figure 6

7. Using flexibility method analyse the frame shown in Figure 7 considering only flexural deformations. Sketch the B.M.D. Consider the horizontal and vertical reactions at C as redundants.

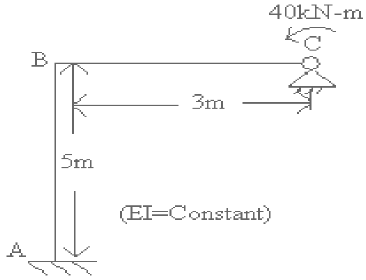

Figure 7

8. Briefly discuss the use of one, two and three-dimensional elements used for discretizing in Finite Element Method along with axisymmetric elements.

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