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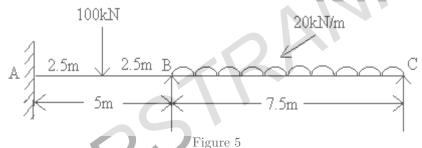
III B.Tech II Semester (R05) Supplementary Examinations, April/May 2011 STRUCTURAL ANALYSIS-II (Civil Engineering)

(For students of RR regulation readmitted to III B.Tech II Semester R05)

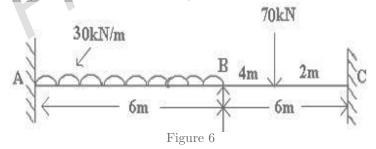
Time: 3 hours

Answer any FIVE questions All questions carry equal marks Max Marks: 80

- 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 $I = I_o \sec \theta$?
- 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 $\overline{AB} = 4m$ and BC = 6m. On AB there is a u.d.l. of 10 kN/m while on BC there is a point load of 30 kN 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 $E = 200 \times 10^6 \text{ kN/}m^2$ and $I = 100 \times 10^{-6} m^4$.



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 ($E = 200 \text{ GN/}m^2 \text{ and } I = 80 \times 10^{-6} \text{ m}^4$).



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.

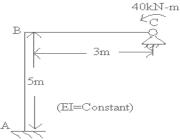


Figure 7

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