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Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards) (Sem.–5)

STRUCTURAL ANALYSIS–II

Subject Code : BTCE-503

M.Code : 70514

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Answer briefly :

(a) What is method of sections for the analysis of trusses? Where do we prefer this method?

(b) How do we check the determinacy of a structure?

(c) What is degree of indeterminacy for a propped cantilever beam having one end fix and other hinged?

(d) Discuss the problem of lack of fit in brief.

(e) How many number of reactions are required for the stability of 2D structures?

(f) Write down any two methods for approximate analysis of structures.

(g) Define Castigliano's theorem II.

(h) What do you understand from a redundant truss? Write down any two methods to solve redundant trusses.

(i) What is the advantage of approximate analysis over conventional methods of structure analysis?

(j) Draw influence line diagram for support reactions at distance 'x' from left end of a simply supported beam of length 'L'when a unit load moves from left end to right end.

SECTION-B

Q2. Analyse the continuous beam shown in figure 1, by moment distribution method. Also draw the bending moment diagram. Moment of inertia for AB = BC = 1, CD = 21.

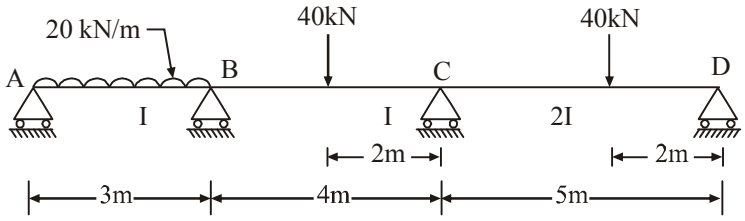

Figure 1

Q3. Find the force in the member BD of the frame as shown in figure 2, if the member BD is subjected to a fall in temperature of 30° C. Area = 1000mm^2 and E = 2.047 × 10^5 N/mm^2 for all the members, $\alpha = 12 \times 10^{-6}$/°C.

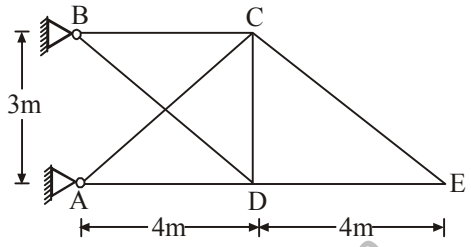

Figure 2

Q4. Determine the influence line for reaction at middle support B of the continuous beam as shown in figure 3. Compute I.L ordinates at every 1 m intervals.

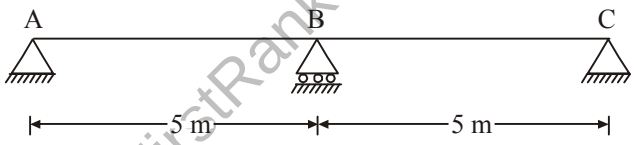

Figure 3

Q5. A beam AB of span 4 m is fixed at A and B and carries a point load of 5 kN at a distance of 1 m from end A. Calculate the support moments by the method of consistent deformation.

Q6. Analyse the symmetric frame as shown in Figure 4 by Kani's method and indicate the final end moments.

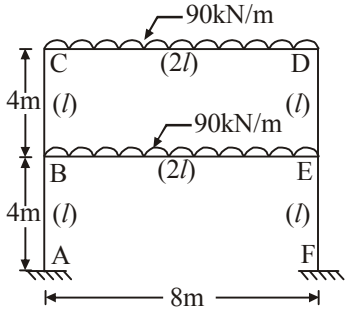

Figure 4

SECTION-C

Q7. Using the portal method, analyse the building frame as shown in Figure 5, subjected to horizontal forces and sketch the B.M diagram.

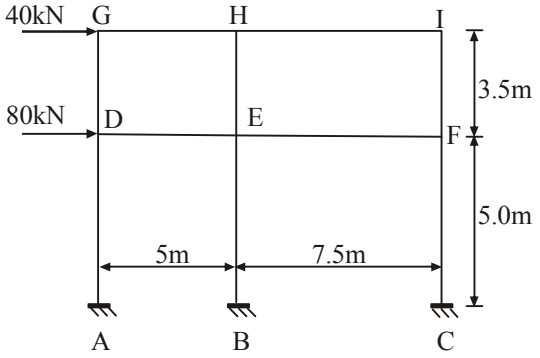

Figure 5

Q8. A continuous beam is loaded as shown in Figure 6. Find the bending moment and reactions at the four supports and hence plot the B.M. and shear force diagrams.

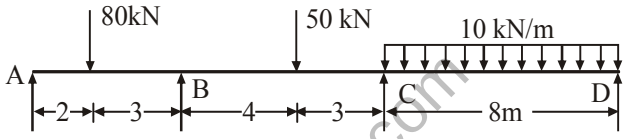

Figure 6

Q9. Use the method of moment distribution to analyse the portal frame as shown in Figure 7 if the hinged support sinks by an amount Δ. The members have the same uniform cross-section.

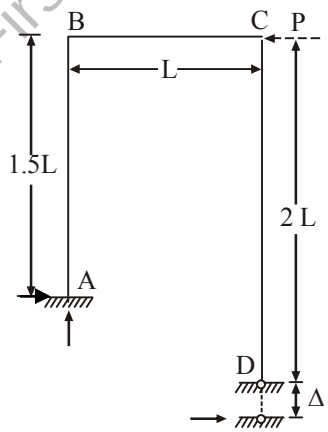

Figure 7

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.