PVP 14

Code: CE5T4

III B.Tech - I Semester – Regular/Supplementary Examinations
March - 2021

STRUCTURAL ANALYSIS-II
(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1.

a) Write the slope deflection equation including the settlement of support.
b) Write the procedure for slope deflection method.
c) What do you mean by distribution factor and write the formula for the same?
d) What is the stiffness of simply supported beam AB subjected to a moment at one of its end "B"?
e) Explain the terms rotation factor and linear displacement factor in Kani's method.
f) Write the expressions for final end moments of one span of a continuous beam as per kani's method.
g) A simply supported beam AB of span L is carrying a U.D.L. of "w" kN/m. Find the midpoint deflection using Castigliano's theorem-II.
h) Write the expression for strain energy stored in a body due to axial loading and explain the terms involved.
i) Write the expression for horizontal thrust for a two hinged arch subjected to loading. Also, explain the terms involved.

j) How do you determine the deflection of truss joints?
k) State betti's law.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.
3 x 16 = 48 M

2. Determine the support moments for the continuous girder shown in the Figure-1 below if the support "B" sinks by 2.50mm. For all members I = 3.50 X 10^7 mm^4 and E = 200 kN/mm^2. Use slope deflection method. Sketch the bending moment diagram. 16 M

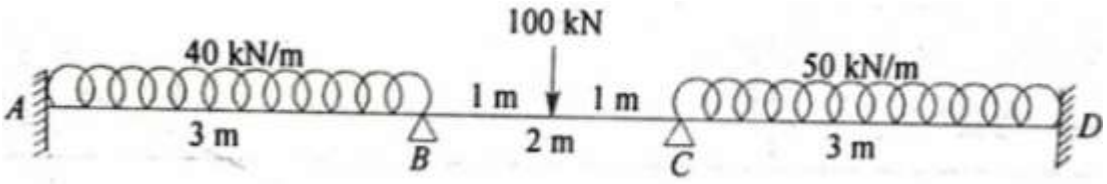

Figure-1

3. Analyse the portal frame shown in Figure-2 below. Use moment distribution method. Sketch the variation of bending moment. 16 M

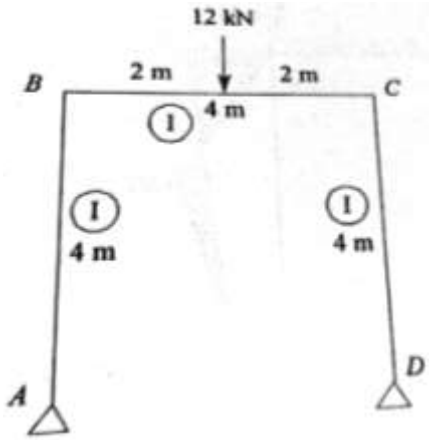

Figure-2

4. Find the support moments at A, B, C, D for the portal frame loaded as shown in Figure-3. Use kani's method. 16 M

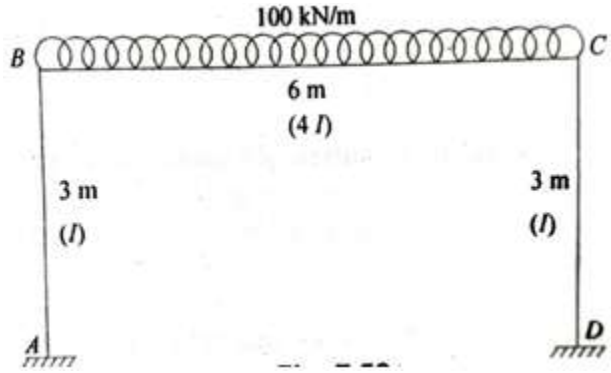

Figure-3

5. A beam AB 4 m long is fixed at A and simply supported at B. It carries a point load of 16 kN at a distance of 1 m from B. Determine the reactions at support and draw bending moment and shear force diagrams. Use principle of least work. 16 M

6. A two-hinged parabolic arch of span 40 m and rise 5 m carries a uniformly distributed load of 5 kN/m on the left half of the span and also a concentrated load of 40 kN at the crown. Determine the horizontal thrust at the supports and the maximum bending moment for the arch assuming secant variation of moment of inertia of the arch section. 16 M