

Code: CE5T4

**III B.Tech - I Semester – Regular Examinations – December 2016**

**STRUCTURAL ANALYSIS - II**  
**(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

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

11x 2 = 22 M

1.

- a) How can you define the static Indeterminacy?
- b) Why the slope-deflection method is so called?
- c) Can you differentiate between bending stiffness and relative bending stiffness of a member?
- d) How the applied moment is distributed among the members connected at a joint?
- e) Why the Kanis method is popular compared to other classical methods?
- f) Express the relationship between the rotation factor and distribution factor.
- g) What are the limitations of Castigliano's theorems?
- h) How do you determine the static indeterminacy for a pin jointed frame?
- i) What are the effects of construction deficiency and support settlement on structure?

- j) What is the Horizontal thrust for a two hinged semicircular arch of Radius “R” subjected to concentrated load “W” at crown?
- k) How the Pinjointed frame differs from Rigid jointed frame in terms of structural action?

### PART – B

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

2. A continuous beam ABCD is fixed at ends A and D and loaded as shown in Figure-1. Spans AB, BC, CD have moments of inertia of I, 1.5I and I respectively and are of the same material. Determine the moments at the supports and plot the BM diagram. Use slope-deflection method.

16 M

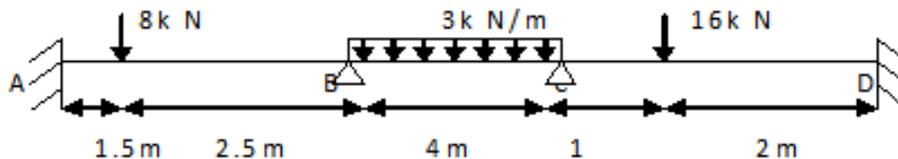


Figure-1

3. Analyse the portal frame shown in Figure-2 below by Moment- distribution method. 16 M

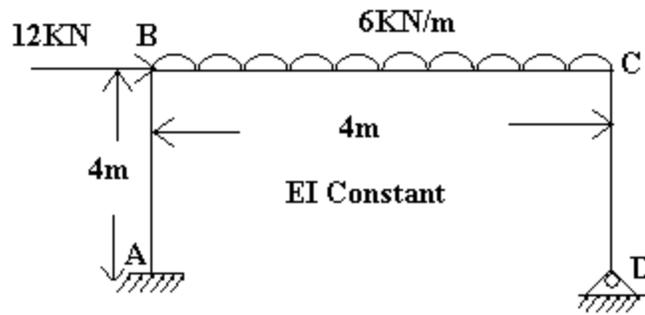


Figure-2

4. Analyse the following frame shown in Figure-3 using Kanis method. EI constant. 16 M

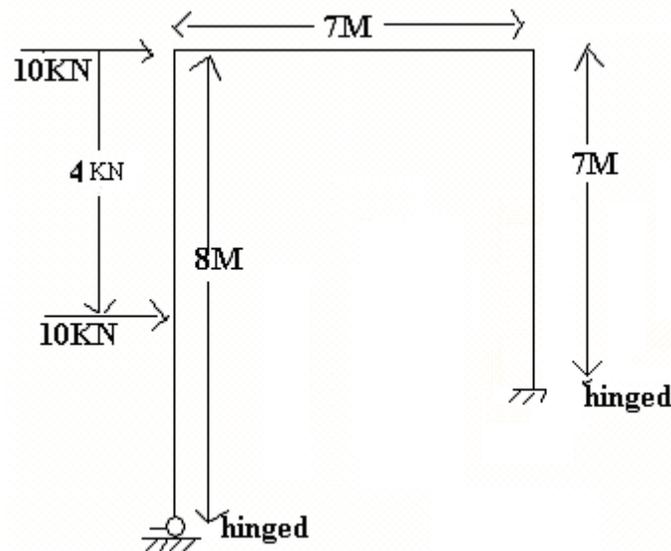


Figure-3

5. Discuss the step-by-step procedure, how the forces in all the members of a Pin jointed frame with single degree of redundancy can be analyzed using the Castiglianos theorem? 16 M

6. A Two hinged Parabolic arch has a span of 60m and a rise of 12m. A concentrated load of 8 kN acts at 15m from the left hinge. The second moment of area varies as the secant of the slope of the rib axis. Calculate the horizontal thrust and reactions at the hinge. Also calculate the maximum BM anywhere in the arch. 16 M