

B.E. DEGREE EXAMINATIONS: APRIL / MAY 2010

Sixth Semester

CIVIL ENGINEERING

U07CE602: Structural Analysis II

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions PART A (10 x 1 = 10 Marks)

1. The Flexibility method is also known as
 - a) Displacement method
 - b) equilibrium method
 - c) Force method
 - d) Stiffness method
2. The assigned coordinates for locations and joints where loads are likely to act is called as
 - a) System Coordinates
 - b) Element Coordinates
 - c) Force Coordinates
 - d) Displacement Coordinates
3. The degrees of freedom assigned for pin jointed frames in Matrix Stiffness are
 - a) 3
 - b) 1
 - c) 0
 - d) 2
4. Matrix Stiffness method deals with forces and displacements for only
 - a) 2 Coordinates
 - b) 4 Coordinates
 - c) Assigned Coordinates
 - d) Zero Coordinates
5. Pin jointed truss is made up of,
 - a) Discrete 1 – D ties
 - b) 2 – D Elements
 - c) 3 – D Elements
 - d) Axisymmetric Elements
6. Which one of the following method is used to express the distributed loads as nodal loads?
 - a) In direct method
 - b) Lumped load method
 - c) Symmetric method
 - d) Impulse method
7. The Shape factor for Circular section is
 - a) 1.5
 - b) 4
 - c) 1.69
 - d) 2.14
8. The Shape factor is also called as
 - a) Mechanical Mechanism
 - b) Load factor
 - c) Rigidity factor
 - d) Static factor
9. In Space trusses, the relationship between the number of members and number joints is given by
 - a) $m = 3j - 5$
 - b) $m = 2j - 6$
 - c) $m = 4j - 2$
 - d) $m = 3j - 6$
10. The maximum sag or dip of the cable varies from,
 - a) $l / 18$
 - b) $l / 20$
 - c) $l / 10$
 - d) $l / 100$

PART A (10 x 2 = 20 Marks)

11. Define flexibility.
12. What is primary structure?
13. What is degree of kinematic indeterminacy in Stiffness method?

14. When do we prefer stiffness method over flexibility method?
15. State some advantages of finite element method.
16. What is discretisation?
17. What is the Shape factor S?
18. What are the two fundamental theorems in plastic analysis?
19. Define the tension co-efficient.
20. In which part of cables the tension is maximum and tension will be minimum?

PART C (5 x 14 = 70 Marks)

21. a) Analyse the Continuous beam Shown in Fig. 1. Assume EI as uniform. Use matrix flexibility method.

(OR)

b) Write the general procedure for solving problems by matrix flexibility method.

22. a) Analyse the portal frame shown in Fig. 2 using Matrix flexibility method.

(OR)

b) Find the end moments of the beam shown in Fig. 3 by stiffness matrix method and sketch the bending moment diagram.

23. a) Explain the basic procedure for adopting Finite element method FEM?

(OR)

b) State and explain the process and guidelines of discretisation with neat sketch.

24. a) Derive the Shape factor for Triangular section.

(OR)

b) Derive the Collapse load for a simply supported beam having point load (W) at the centre.

25. a) Using the method of Tension Coefficients, Analyse the plane truss shown in Fig. 4, and find the forces in the member.

(OR)

b) A suspension bridge of 250m span has two numbers of 3 hinged stiffening girders supported by cables with a central dip of 25m. The four point loads of 300KN each are placed at the centre line of the road way at 20m, 30m, 40m and 50m from left hand hinge. Find Shear force and bending Moment in each girder at 62.5m from each end. Also find Maximum tension in cable.

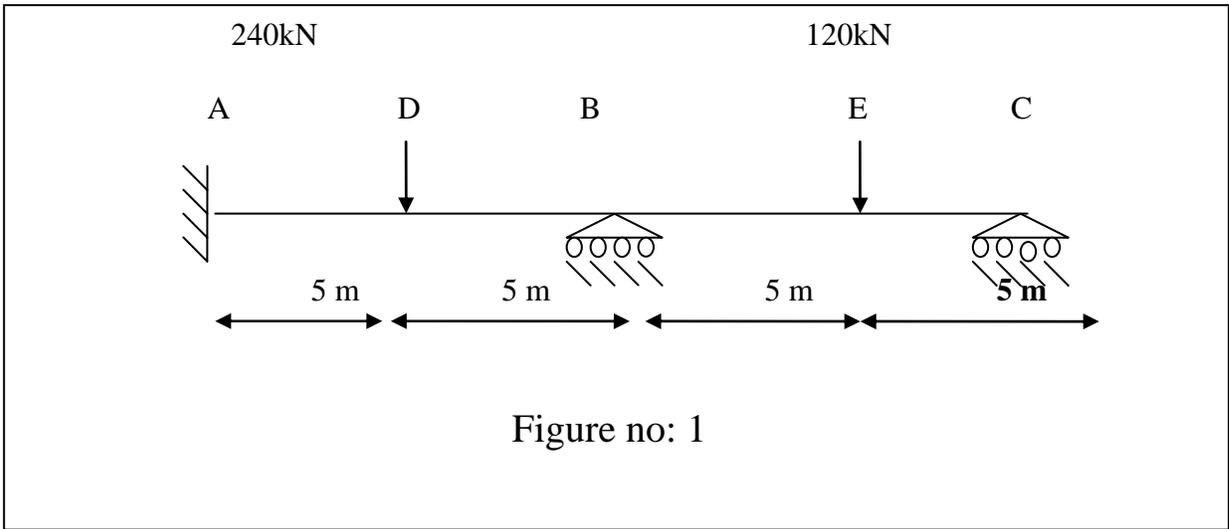


Figure no: 1

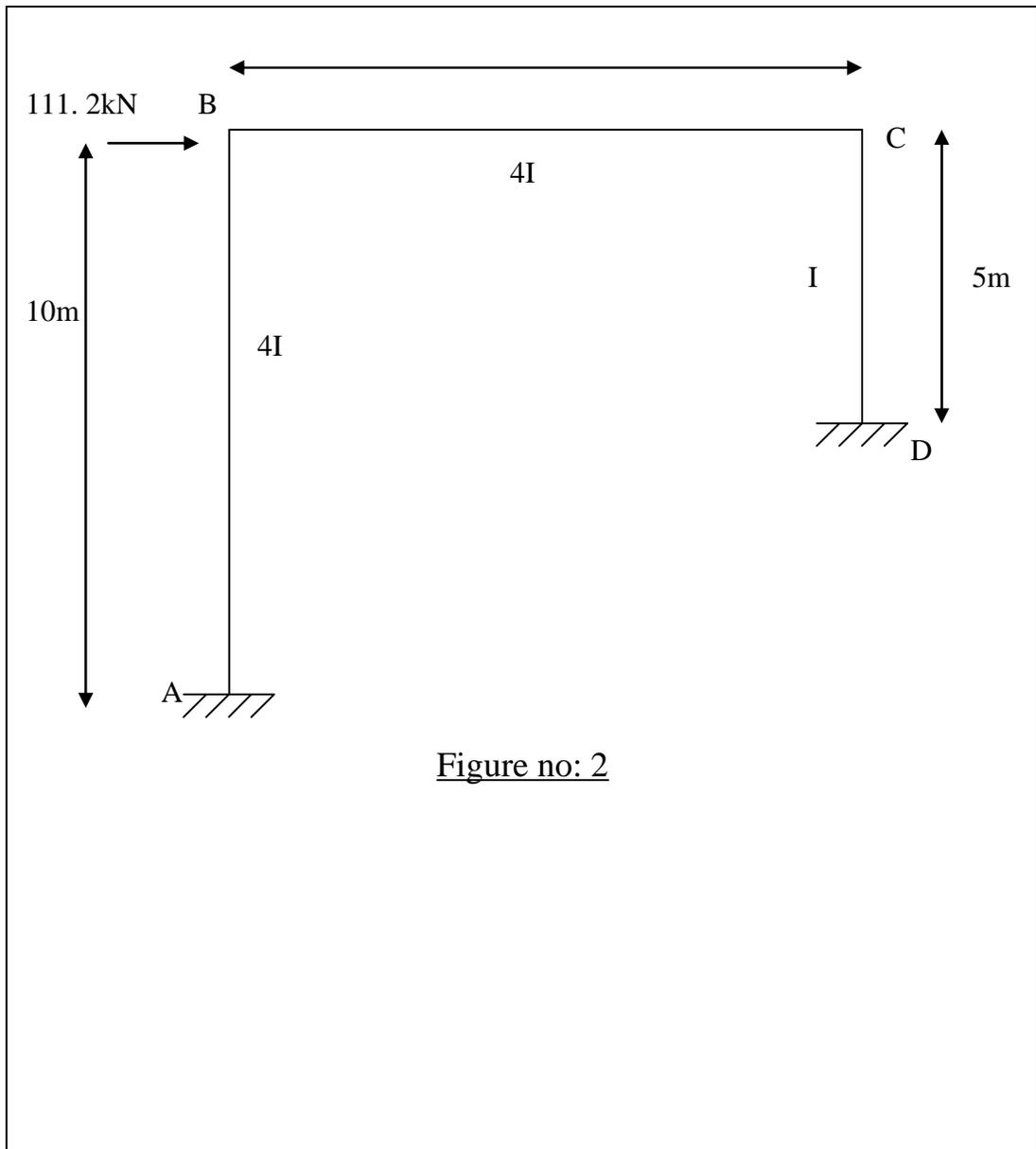


Figure no: 2

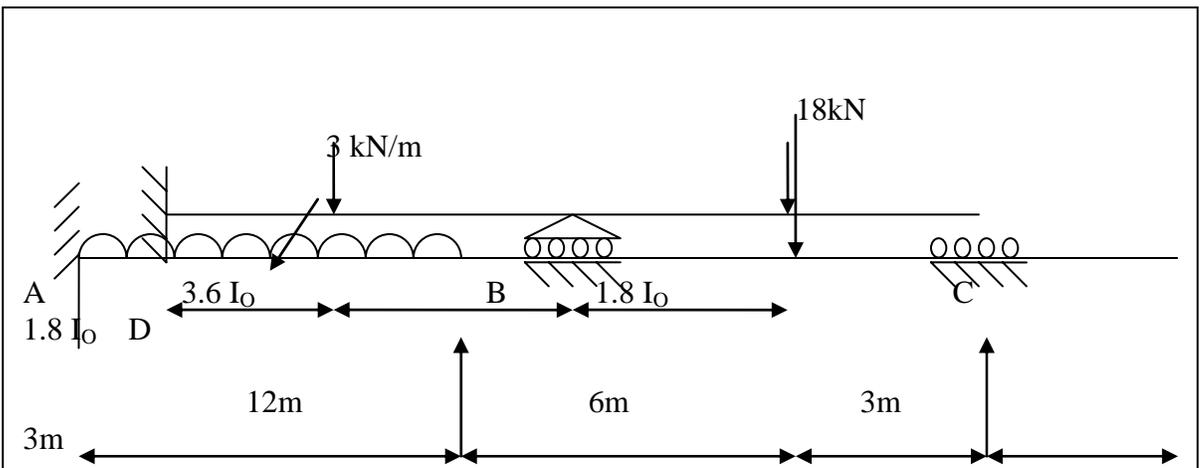


Figure no. 3

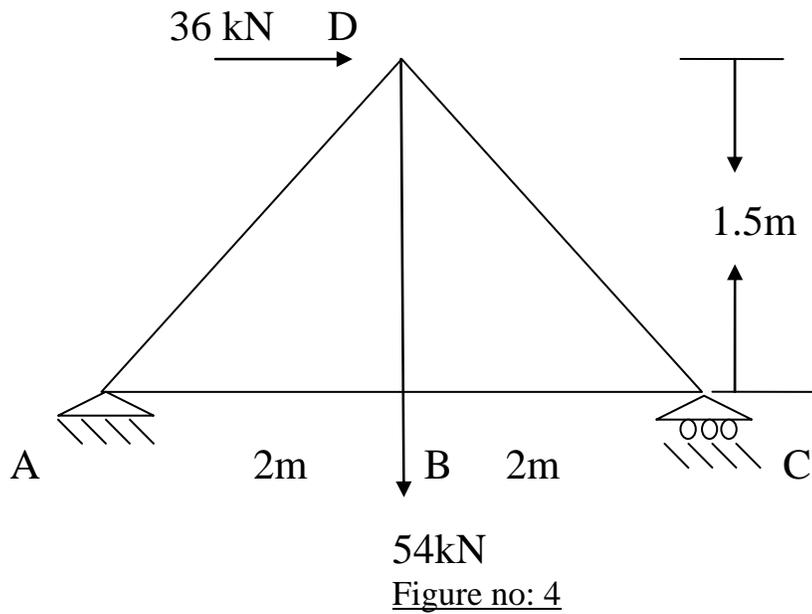


Figure no: 4