No. of Printed Pages : 3

BICE-011

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00582

December, 2017

BICE-011 : STRUCTURAL ANALYSIS – II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Assume any missing data. Use of scientific calculator is allowed.*

1. Analyse the frame shown in Figure 1 below by moment distribution method. Draw the bending moment diagram. The moment of inertia values are indicated in the figure. *14*

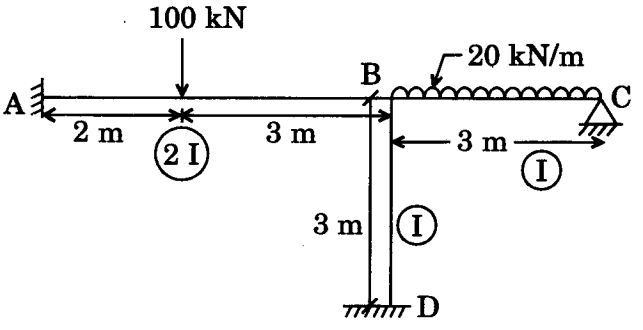

Figure 1

2. Analyse the beam loaded as shown in Figure 2 using the slope deflection method. Portion AB has a moment of inertia as 1·5 I and BC has this value as I. Draw the bending moment and shear force diagrams. *14*

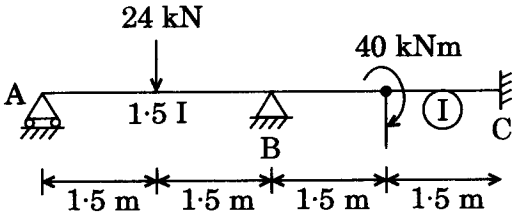

Figure 2

3. (a) Explain the characteristics of a hinged support with a sketch. *6*

   (b) Explain how maximum negative shear force at a section in a simply supported beam due to a moving UDL, longer than span, is calculated. *8*

4. (a) Briefly explain the method of section for analysis of pin-jointed trusses. *6*

   (b) Differentiate between a three-hinged and a two-hinged arch with neat sketches. *8*

5. Find the fixed end moments for the fixed beam with applied moment at distance 'a' from the left end, as shown in Figure 3. *14*

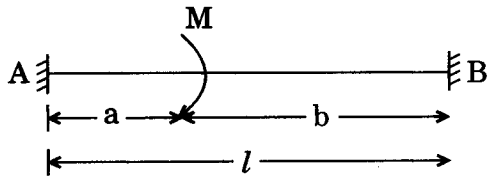

Figure 3

6. A uniform load of 2000 N/m, 5 m long, crosses a girder of 20 m span from left to right. Calculate the maximum shear force and bending moment at a section 8 m from the left hand support. *14*

7. A uniformly distributed load of 4000 N/m covers the left hand half of the span of a three-hinged parabolic arch of span 36 m and central rise 8 m. Determine the horizontal thrust. Also find the bending moment, shear force and normal thrust at the loaded quarter point. *14*

8. Write short notes on any ***two*** of the following : *2×7=14*

   (a) Kinematic Determinacy

   (b) Equivalent UDL for a Moving Load

   (c) Strain Energy

   (d) Modulus of Rigidity