No. of Printed Pages : 5

BICE-011

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00111

June, 2015

BICE-011 : STRUCTURAL ANALYSIS – II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Use of scientific calculator is permitted. Assume any missing data suitably. All questions carry equal marks.*

1. Using the method of sections, compute forces in Pratt-truss loaded as shown in Figure 1. *10*

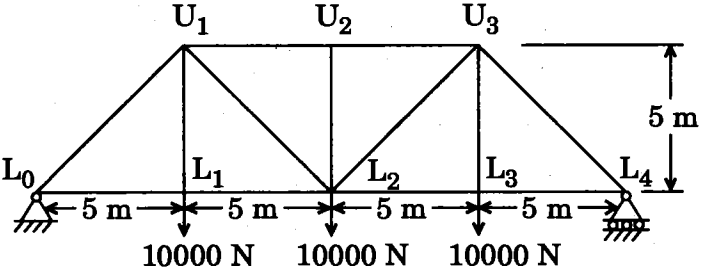

Figure 1

2. (a) Draw the influence line diagram for the system shown in Figure 2. Find reaction at B. *5*

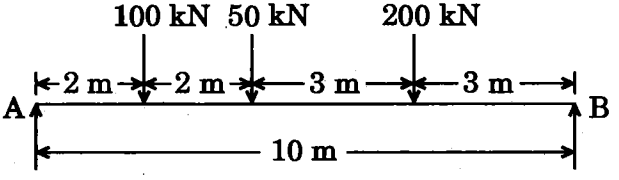

Figure 2

(b) Two wheel loads, 80 kN and 200 kN, spaced 2 m apart, move on a girder of span 16 m. Find the maximum positive and negative shear force at a section 4 m from the left end. Any wheel load can lead the other. 5

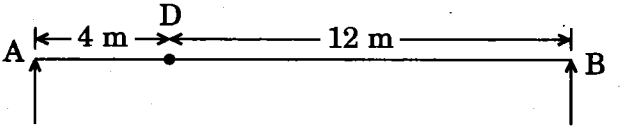

Figure 3

3. (a) A simply supported girder has a span of 12 m. A 200 kN wheel load moves from one end to the other end on the span of the girder. Find the maximum bending moment which can occur at a section 4 m from the left end. 5

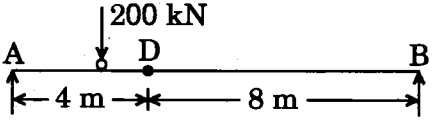

Figure 4

(b) A live load of 8 kN per metre moves on a simply supported girder of span 12 m. Find the maximum bending moment which can occur at a section 4 m from the left end. 5

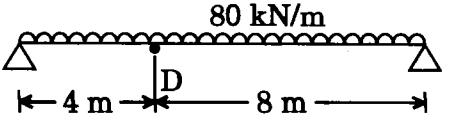

Figure 5

4. A three-hinged arch of span 'L' and rise 'h' carries a uniformly distributed load of 'w' per unit run over the whole span. Show that the horizontal thrust at each support is $\frac{wL^2}{8h}$. *10*

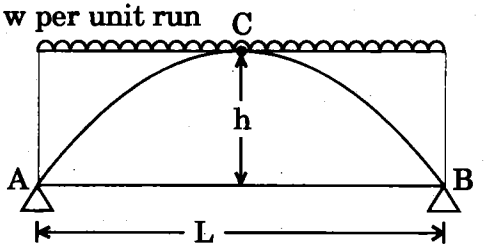

Figure 6

5. A two-hinged semicircular arch of radius 'R' carries a uniformly distributed load of w per unit run over the whole span. Determine the horizontal thrust at each support. Assume uniform flexural rigidity. *10*

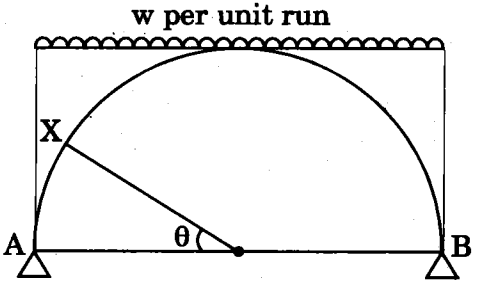

Figure 7

6. A beam ABC of length 16 m consists of span AB and BC each 8 m long and is simply supported at A, B and C. The beam carries a uniformly distributed load of 40 kN/m on the whole length. Find reactions at the supports and support moments. *10*

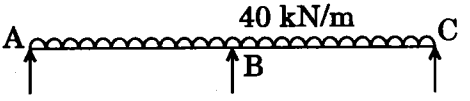

Figure 8

7. Find the fixed end moments for the beam loaded as shown in Figure 9. Also draw the B.M. diagram. *10*

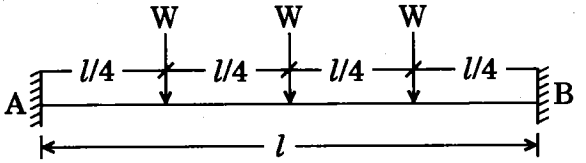

Figure 9

8. A continuous beam ABC consists of span AB = 3 m and BC = 4 m, the ends A and B are fixed. AB and BC carry uniformly distributed loads of intensity 4 kN/m and 5 kN/m respectively. Find the support moments and draw the bending moment diagram for the beam. The beam is of uniform section throughout. Use slope deflection method. *10*

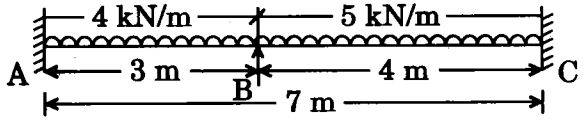

Figure 10

9. Analyse the continuous beam shown in Figure 11 by moment distribution method. *10*

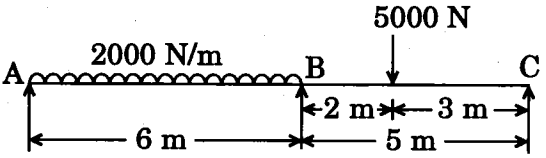

Figure 11

10. Write short notes on the following : $4 \times 2\frac{1}{2} = 10$

(a) Eddy's Theorem

(b) Rib Shortening Effects in Arches

(c) Virtual Work Principles

(d) Kinematic Indeterminacy