No. of Printed Pages : 4

BICE-011

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

June, 2019

00655

BICE-011 : STRUCTURAL ANALYSIS – II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. Show that the strain energy stored by an elastic prismatic rod of length 'l', sectional area 'A' and modulus of elasticity 'E' subjected to tension 'T' may be expressed as $\frac{T^2 l}{2AE}$. *14*

2. A uniformly distributed load of 6 kN/m of length 5 m moves on a girder of span 16 m as shown in Figure 1. Draw the influence line diagram for shear force at C and calculate the maximum positive and negative shear force at the section C due to the moving load. *14*

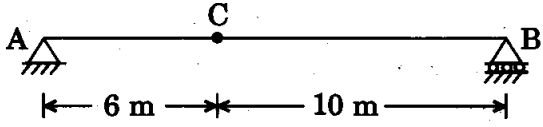

Figure 1

3. Find the axial forces in all the members of the truss with loading as shown in Figure 2. *14*

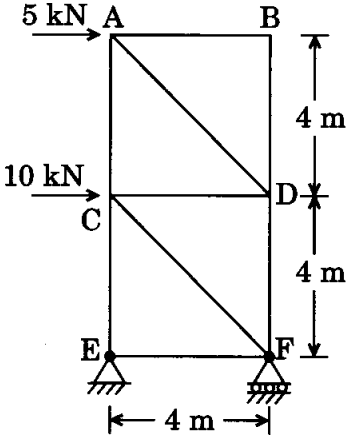

Figure 2

4. (a) Discuss the characteristics of an internal hinge with regard to transfer of shear force and bending moment in a beam. *7*

(b) What do you understand by indeterminate structures ? Write some of their advantages in comparison to determinate structures. *7*

5. A three-hinged parabolic arch has a span of 25 m and a rise of 5 m. It is subjected to a UDL of 10 kN/m over the leftmost length of 5 m. Both supports are at the same level. Find the reactions at supports and bending moment at 10 m from the left support. *14*

6. (a) Describe the method of consistent deformation for calculating reaction in a propped cantilever at the location of the prop. 7

(b) Determine the support reactions in the propped cantilever shown in Figure 3. EI is constant. 7

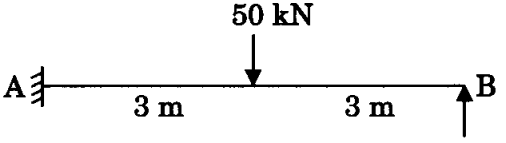

Figure 3

7. Analyse the frame shown in Figure 4 by slope deflection method. 14

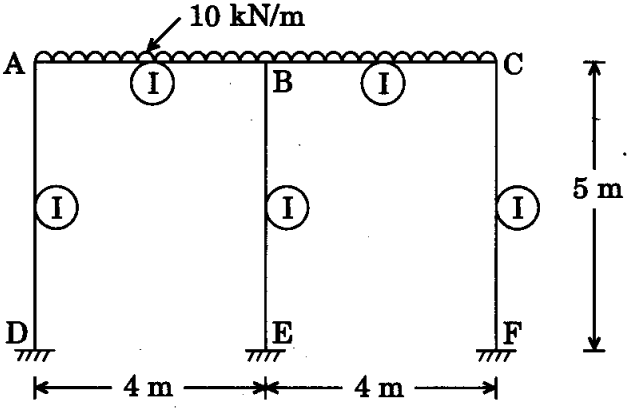

Figure 4

8. Write short notes on any ***four*** of the following topics : $4 \times 3\frac{1}{2} = 14$

(a) Castigliano's theorems

(b) Method of points of truss analysis

(c) Influence line diagram and its uses

(d) Unstable structures

(e) Eddy's theorem