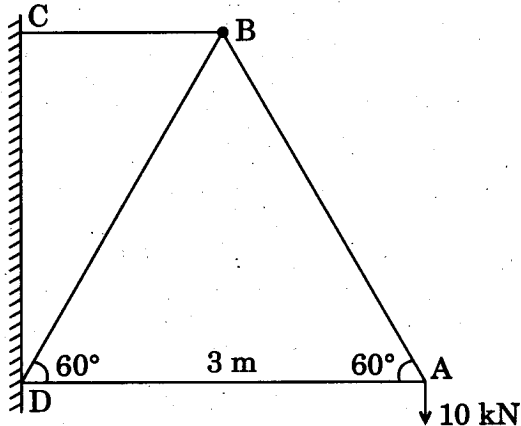


**B.Tech. CIVIL ENGINEERING (BTCLEVI)****Term-End Examination****June, 2018****00383****BICE-011 : STRUCTURAL ANALYSIS – II***Time : 3 hours**Maximum Marks : 70*

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

1. (a) Describe the 'Method of Sections' for analysis of a truss. 7
- (b) A cantilever truss of 3 m span is loaded as shown in Figure 1. Find the forces in all members of the truss. 7

*Figure 1*

2. (a) What do you understand by rolling loads ? Describe different types of rolling loads. 7
- (b) A uniformly distributed load of 1 kN/m which is 6 m long crosses a simply supported girder of 16 m span. Construct the maximum shear force diagrams (negative as well as positive) and find the values at a section 3 m from left hand support. 7
3. A three-hinged parabolic arch of 20 m span and 4 m central rise carries a point load of 4 kN at 4 m horizontal distance from left hand hinge. Calculate the normal thrust and shear force at the section under the load. Also, calculate the maximum positive and negative bending moment in the arch. 14
4. (a) What is a suspension bridge ? With the help of a neat sketch show the elements of a suspension bridge. 7
- (b) A flexible rope weighing 1 N per metre span between two points 40 m apart and at the same level, 12 m above the ground. It is to carry a concentrated load of 300 N at a point P on the rope which is to be at a horizontal distance of 10 m from the left hand support. What is the maximum height above the ground to which the point P may be raised if the maximum tension in the rope is not to exceed 1000 N ? Assume that the distances measured along the rope are equal to their horizontal projection. 7

5. (a) Describe the method of superposition to analyse statically indeterminate structures. 7
- (b) Find the support moments of a fixed beam loaded at third points by two point loads  $W$  each. Also draw bending moment and shear force diagrams for the beam. 7

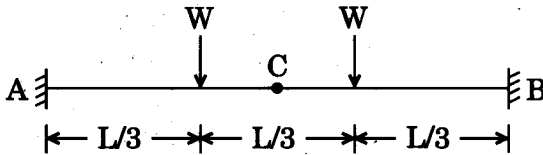


Figure 2

6. A continuous beam ABCD is shown in Figure 3. Using slope deflection method, determine the bending moments at the supports and draw the bending moment diagram. 14

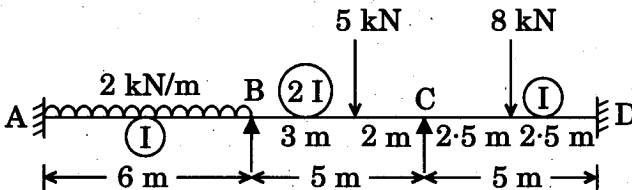


Figure 3

7. Write short notes on any *two* of the following:  $2 \times 7 = 14$
- (a) Castigliano's Theorems
- (b) Method of Joints of Analysis of Truss
- (c) Moment Distribution Method