

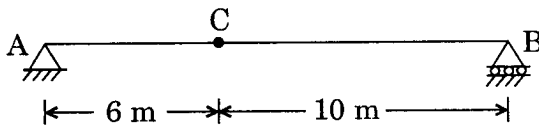
B.Tech. CIVIL ENGINEERING (BTCLEVI)**Term-End Examination****December, 2018**

00123

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. Two wheel loads 20 kN and 8 kN spaced at 2 m apart move along the span of girder of length 16 m, shown in Figure 1. Draw the influence line diagram for bending moment at C and find the maximum bending moment that may occur at C, due to wheel loads. Any wheel load can lead the other one. 14

*Figure 1*

2. A cantilever is carrying a concentrated load P at the free end as shown in Figure 2. Show that the strain energy stored by the cantilever may be expressed as $\frac{P^2 l^3}{6 EI}$, where E is modulus of elasticity and I is moment of inertia. 14

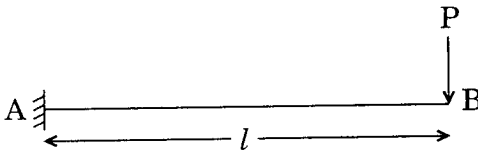


Figure 2

3. Find the axial forces in all the members of the truss shown in Figure 3. 14

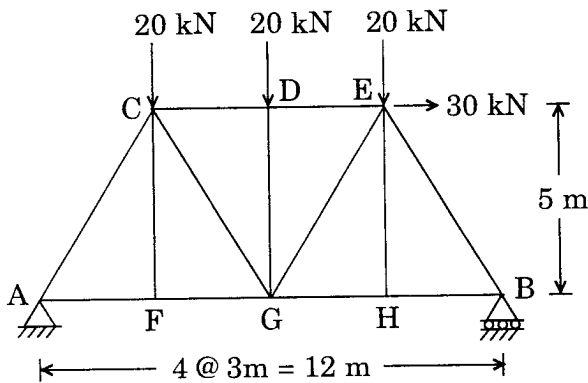


Figure 3

4. A cable carrying a load of 10 kN per metre run of horizontal span, is stretched between supports 100 m apart. The supports are at the same level and the central dip is 8 m. Find the greatest and the least tension in the cable. 14

5. A three-hinged parabolic arch with span 'L' and rise 'h' is subjected to a UDL of w kN/m on its full span. Show that the bending moment at any point across the span is zero. 14
6. (a) What do you understand by indeterminate structures? What are the different types of indeterminacy in structures? 7
- (b) Explain how a moving UDL, shorter than span, should be placed at a section in a simply supported span so that the maximum bending moment at that section is obtained due to the load. 7
7. Analyse the simple frame shown in Figure 4 by moment distribution method. 14

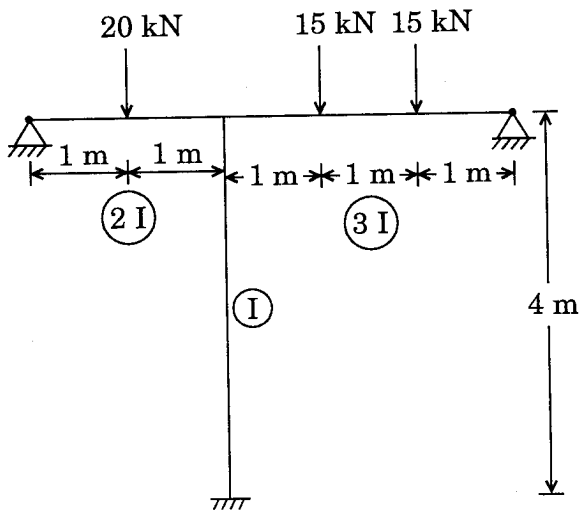


Figure 4

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

- (a) Distribution Factor
 - (b) Principle of Virtual Work
 - (c) Effect of Temperature in Two Hinged Arches
 - (d) Method of Sections
 - (e) Slope Deflection Method
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