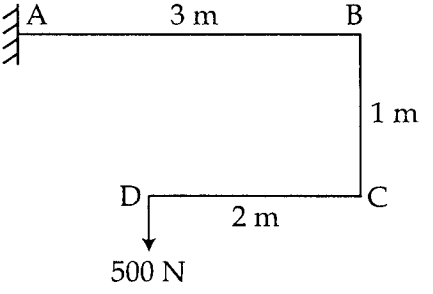
00613

B. TECH. CIVIL ENGINEERING
(BTCLEVI)
Term-End Examination
December, 2012
BICE-011: STRUCTURAL ANALYSIS - II

Time : 3 hours *Maximum Marks : 70*

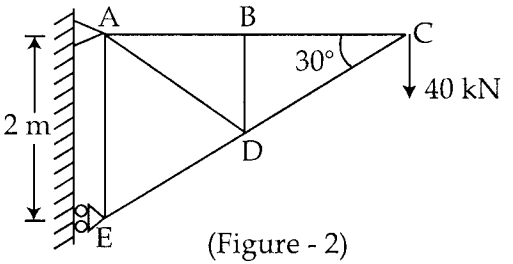
Note : *Answer **any seven** Questions. All question carry **equal** marks. Assume missing data if any. Use of calculator is permitted.*

1. A mild steel bar 100 mm diameter is bent as shown in Figure-1. It is fixed horizontally at 'A' and load of 500 N hangs at 'D'. Find the vertical deflection at 'D'. Take $E = 2*10^5$ N/mm^2 **10**



(Figure - 1)

2. Find the vertical and horizontal deflections of the joint 'C' of the loaded truss shown in Figure-2. The cross sectional area of CD and DE are each 2500 mm^2 and those of other member are each 1250 mm^2. Take $E = 2*10^5$ N/mm^2 **10**



(Figure - 2)

3. Four wheel loads of 6, 4, 8 and 5 kN cross a girder of 20 m span, from left to right, followed by U.D.L. of 4 kN/m and 4 m long with the 6 KN load loading. The spacing between the loads in the same order are 3 m, 2 m and 2 m. The head of the U.D.L. is at 2 m from the last 5 kN load. Using influence lines, calculate the S.F. and B.M. at a section 8 m from the left support when the 4 kN load is at centre of the span. **10**

4. A three-hinged circular arch of span 40 m and rise 8 m carries a concentrated load of 120 kN at a horizontal distance of 10 m from the left end. Find the reactions at the supports and the maximum positive and negative bending moment. **10**

5. A two-hinged parabolic arch of span 'l' and rize 'h' carries a concentrated load 'W' at the crown. Show that horizontal thrust equals $\frac{25\,Wl}{128\,h}$, at each support. **10**

6. Find the fixed end moments for the beam carrying uniformly varying load shown in Figure-3. **10**

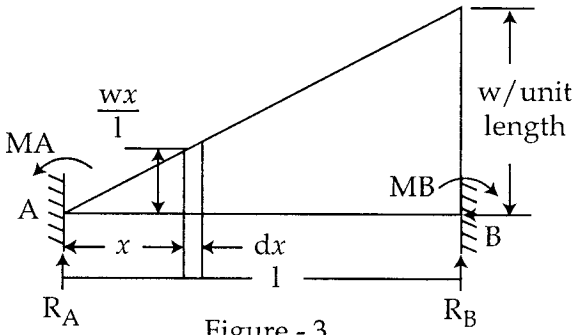
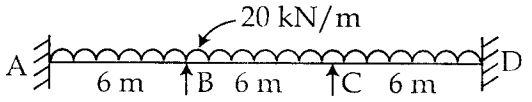


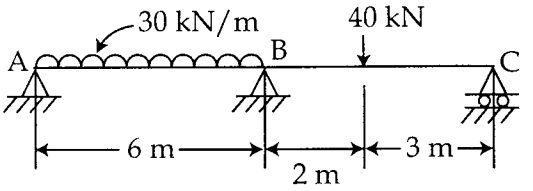
Figure - 3

7. Analyse the continuous beam loaded as shown in Figure-4 by slope deflection method. Draw SFD and BMD. EI is constant **10**



(Figure - 4)

8. Analyse the continuous beam shown in Figure-5 by moment distribution method. Draw SFD and BMD. EI is constant. **10**



(Figure - 5)

9. Analyse the portal frame shown in Figure-6 by moment distribution method and draw the bending moment diagram. **10**

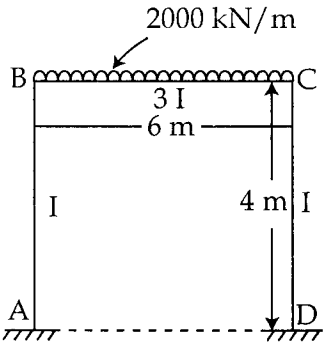


Figure - 6

10. Write short notes on **any two** of the following : **2x5=10**

(a) Force method of analysis

(b) Influence line diagram

(c) Strain Energy