No. of Printed Pages : **4 + Drawing Sheet**

BICE-011

01655

BTCLEVI

Term-End Examination

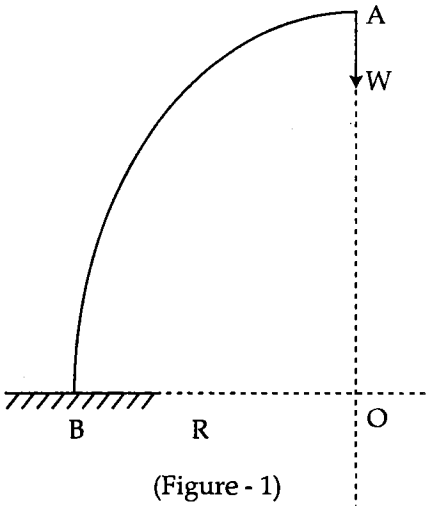
June, 2012

BICE-011: STRUCTURAL ANALYSIS - II

Time : 3 hours *Maximum Marks : 70*

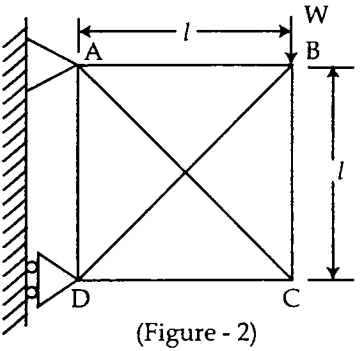
Note : *Answer **any Seven** questions. All question carry **equal** marks. Assume missing data if any. Use of calculator is permitted.*

1. Find the strain energy stored by the quadrantal ring of radius 'R' shown in figure-1. Hence calculate the vertical displacement of the end 'A' **10**



(Figure - 1)

2. Find the forces in the members of the frame shown in figure-2. All the members have the same cross-sectional area and are of same material. **10**



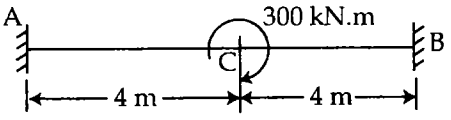
(Figure - 2)

3. Prove that the bending moment under a chosen load of a wheel system on a simply supported girder will be a maximum, when the load system is so placed on the girder that the chosen load and the resultant of all the wheel loads are equidistant from the middle point of the girder. **10**

4. A three hinged Parabolic arch of span 20 m and central rise 4 metre carries a uniformly distributed load of 20 kN per metre run on the left half of the span. Find the maximum bending moment for the arch. **10**

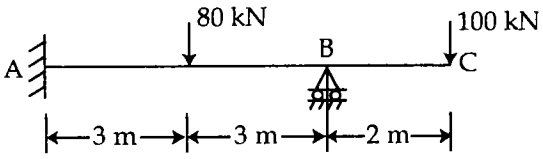
5. A two hinged semicircular arch of radius 'R' carries a concentrated load 'W' at the crown. Show that the horizontal thrust at each support is $\frac{W}{\pi}$. Assume uniform flexural rigidity. **10**

6. A Fixed beam 'AB' (Fig.3) of span 6 metres is subjected to a concentrated couple of 300 kNm applied at section C, 4 metres from the end 'A'. Draw SFD and BMD. **10**



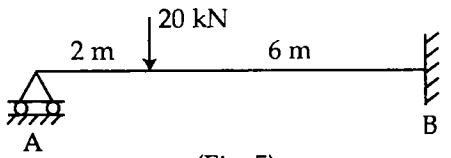
(Figure - 3)

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



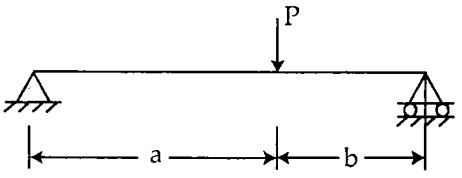
(Fig. 4)

8. Analyse the propped cantilever beam loaded as shown in fig-5 by moment distribution method. Draw SFD and BMD. EI is constant. **10**



(Fig. 5)

9. A beam of span 'l' (Fig-6) is simply supported. It carries a concentrated load (P) ecentrically placed on the span. Determine the deflection under the load. Use moment area theorem. **10**



(Figure - 6)

10. Write short notes on *any two* of the followings. **10**

(a) Displacement method Vs Force method

(b) Eddy's theorem

(c) Virtual work principle