B. TECH. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

June, 2014

BICE-011: STRUCTURAL ANALYSIS - II

Time : 3 hours　　　　　　　　*Maximum Marks : 70*

Note :　(i)　*Answer any seven questions.*

　　　　(ii)　*All questions carry equal marks.*

　　　　(iii)　*Assume missing data if any. Use of calculator is permitted.*

1.　A cantilever of length 2a is carrying a load of "W"　**10**
at the free end, and another load "W" at its centre
as shown below. Determine the slope and
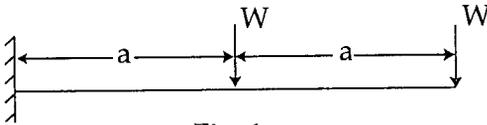deflection of the cantilever at the free end shown
in figure-1.

Fig. 1

2.　A cantilever of 2 m span carries a triangular load　**10**
of zero intensity at the free end, and 10 t/m at
the fixed end. Determine the slope and deflection
at the free end. Take $I = 10,000$ cm^4,
$E = 2.0 \times 10^6$ kg/cm^2.

3. A three hinged circular arch of span 21 m has a   **10**
   rise of 4 m. The arch is loaded with a point load
   of 8t at a horizontal distance of 6 m from the left
   support. Determine the horizontal thrust, two
   reactions and bending moment under the load.

4. A parabolic arch, hinged at its springings, of span   **10**
   36 m and rise 8 m is loaded as shown in figure - 2.

Fig. 2
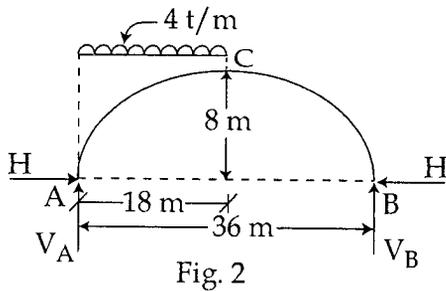
Determine the value of horizontal thrust as well
as maximum positive and negative B.M over the
arch.

5. A continuous beam ABC 10 m long rests on   **10**
   supports A, B and C at the same level and is
   loaded as shown in figure - 3.

Fig. 3
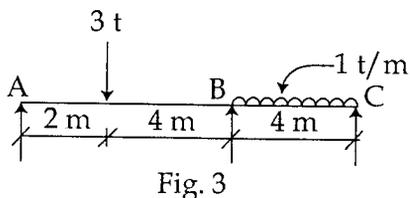
Draw the B.M.D by moment distribution method.

6. Analyse the frame shown below by slope   **10**
deflection method.

Fig. 4
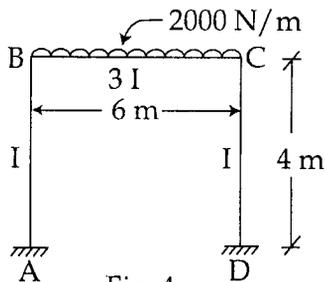
7. A uniformly distributed load of 5 t/m of 6 m   **10**
length crosses a simply supported girder of span
40 m from left to right. With the help of influence
lines, determine the values of maximum
S.F and B.M at a point 12 m from the left support.

8. Find the fixed end moment of the beam shown in   **10**
figure-5.

Fig. 5
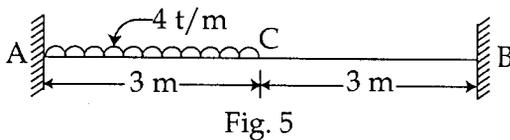
9. Write short notes on **any two** of the following :   **10**

(a) Slope deflection method

(b) Virtual work method

(c) Strain energy