and negative shear force at section 4m from left support and 5m from right support. Also find the absolute maximum bending moment that may occur any where in the girder.

OR

10. Write notes on the following:
    i) Equivalent uniformly distributed load.
    ii) Focal length.
    iii) Influence lines.
    iv) Determinate & in determinate structures.

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Roll No .....

CE - 505

B.E. V Semester

Examination, December 2012

Theory of Structure - I

Time : Three Hours

Maximum Marks : 70/100

Note : *1. Attempt any Five questions.*
2. Assume missing data suitably if any.

1. Analysed the portal frame with hinged base, loaded as shown in Fig. 1 by the strain energy method. Sketch the bending moment diagram.

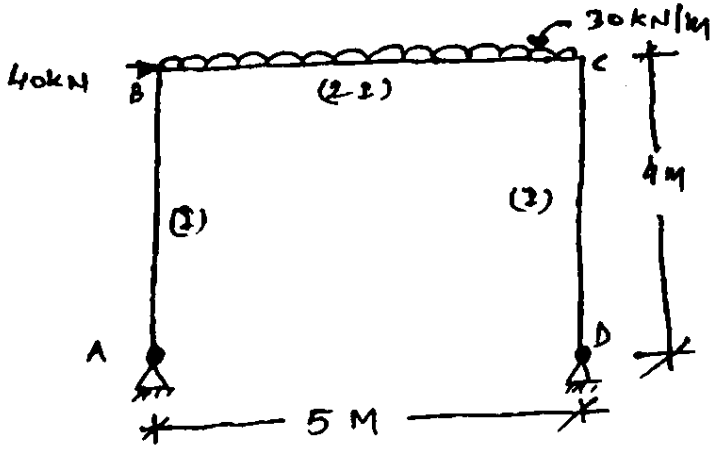


Fig. (1)

OR

2. Using Castigliano's theorem of minimum strain energy, analyse the frame as shown in Fig. 2. EI is constant for the whole frame. Sketch the bending moment diagram.

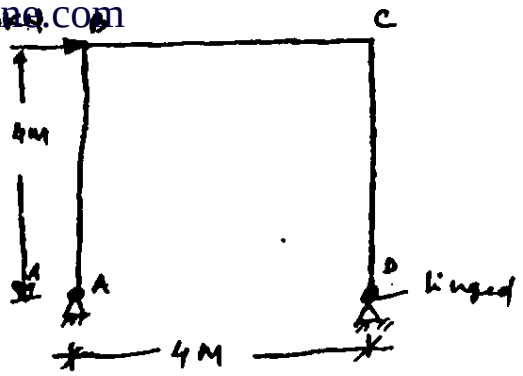
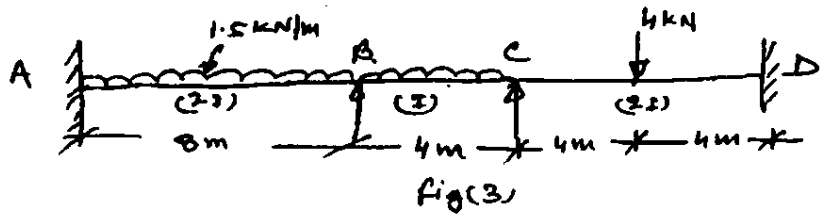


Fig (2)

3. Continuous beam ABCD is loaded as shown in Fig. 3. During the loading support B sinks by 1cm. Determine the support moments. I = 1600cm^4, E = 2 x 10^5 N/mm^2. (by moment distribution method).

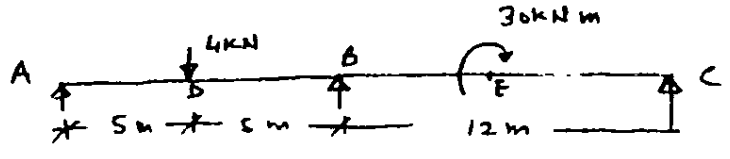


fig(3)

OR

4. a) Explain and prove the Clapeyron's theorem of three moment.

   b) A continuous beam ABC of constant moment of inertia is simply supported at A B and C. The beam carries a central point load of 4 kN in span AB and a central clockwise couple of moment 30 kN. m in span BC as shown in Fig 4. Find the support moments and plat the SFD & BMD.



(fig 4)

5. A beam AB of span *l* and fixed at its both ends carries a point load W at C, the centre of the span. Determine the fixed end moments, if the moment of inertia for AC is 2I and that for BC = I. (by column analogy method).

 OR

6. A continuous beam ABC is supported on an elastic column BD and is loaded as shown in Fig. 5. Treating joints B as rigid, analyse the frame and plot the BMD and deflected shape of the frame. (by using slop deflection method).

7. A symmetrical three hinged circular arch has span of 24m and a rise to the central hinge of 6m. It carries a. U.D.L of 10 kN/m on left half span. Find a) the magnitude of the thrust at the springing b) the maximum +Ve and -Ve moment c) normal thrust and radial shear at 8m from left end.

OR

8. A 8m suspension bridge of 120m span has two three-hinged stiffening girders supported by two cables having a central dip of 12m. The roadway has a width of 6.0m. The dead load on bridge is 5 kN/m^2 while the live load is 10 kN/m^2. Which acts on the left half of the span. Determine the shear force and bending moment in the girder at 30m from left end. Find also the maximum tension in the cable for this position of live load.

9. A simple girder of 18m span is traversed by a moving udl of 5m length with an intensity of 20 kN/m, from left to right. Find the maximum bending moment and maximum positive