



Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
Branch : Civil
08.403 : STRUCTURAL ANALYSIS I

Time : 3 Hours

Max. Marks : 100

Instruction : Answer **all** questions of Part **A** and **any one** question from **each** Module of Part **B**.

PART – A

1. Derive the differential equation for deflection.
2. Determine slope and deflection at the free end of a cantilever subject to moment of free end .
3. Find the deflection of midspan of a simply supported beam subjected to u.d.l. of left half span.
4. Explain Beffi's theorem.
5. Explain the behaviour and types of arches.
6. Discuss the limitations of Euler's formula.
7. Draw the influence line diagram for reactions in simply supported beams.
8. Explain equivalent uniformly distributed load. **(8x5=40 Marks)**

PART – B

Module – I

9. A simply supported beam of span 6 m is subjected to a point load of 20 kN at 4 m from left end. Determine the slop at midspan, deflection below the load and maximum deflection. $E = 2 \times 10^5 \text{ N/mn}^2$, $I = 16 \times 10^6 \text{ mm}^4$. **20**

OR

P.T.O.



10. Determine slopes at the supports and deflection of midspan of a simply supported beam of span 10 m carries concentrated load of 50 kN at centre. Moment of inertia for the right half span is double that of left half. Use conjugate beam method. **20**

Module – II

11. Find the horizontal and vertical deflection at the free end of the rigid jointed frame shown in figure 1 by principle of virtual work. $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 2 \times 10^7 \text{ mm}^4$. **20**

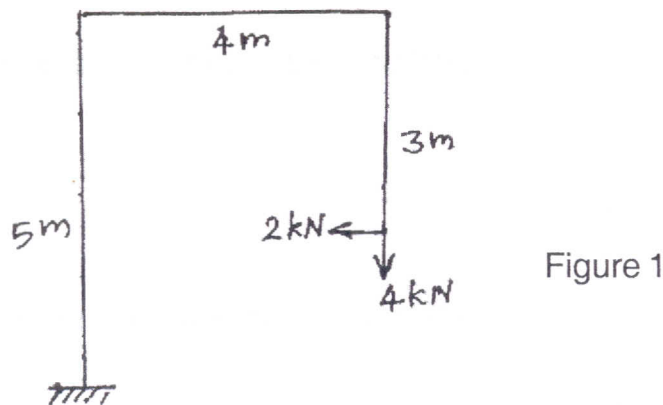


Figure 1

OR

12. Figure 2 shows the plan of a tripod. The feet A, B and C being the same horizontal plane and apex D 5 m above the plane. Find the forces in the members. **20**

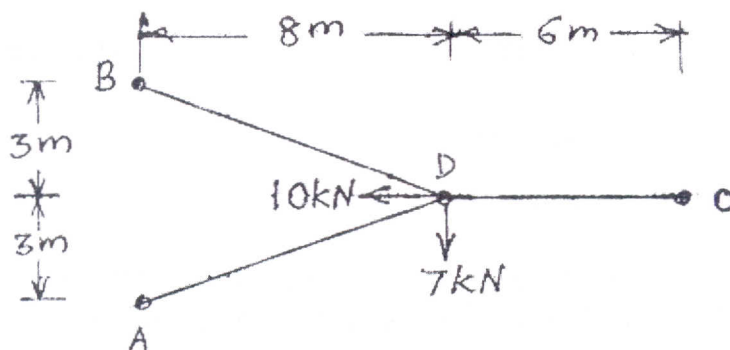


Figure 2



Module – III

13. a) Derive Euler's buckling load for slender columns with ends hinged.
- b) A hinged ended column of length 3 m and square cross section is to be made of wood. Assuming $E = 12 \text{ GPa}$ and allowable stress 12 MPa , determine the size of column to support a load of 100 kN. 20

OR

14. Uniform load of 25 kN/m and 6 m long crosses a girder of span 30 m . Determine the maximum SF and BM at sections 5 m and 10 m from left end. Draw maximum SFD and BMD. 20
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