



Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, May 2014
(2008 Scheme)
Branch : CIVIL
08.403 : Structural Analysis – I

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions of Part – A.

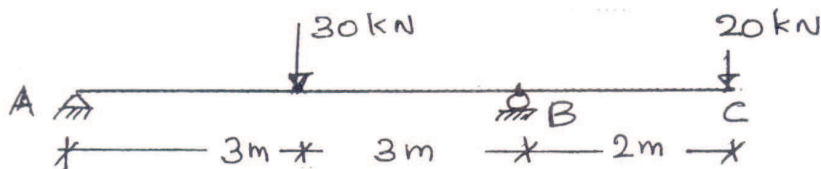
1. Explain the concept of stability and determinacy of structures.
2. Determine the slope and deflection at the free end of cantilever loaded with u.d.l. w/m length on its half span from the fixed end.
3. State and explain moment area theorems.
4. Derive the expression for strain energy due to bending.
5. Explain the principle of virtual work.
6. Find the horizontal thrust for a semicircular three hinged arch subjected to a u.d.l. w/m length throughout the span.
7. What are assumptions made in the Euler's theory ?
8. What is meant by Influence line diagram. Draw the I.L.D. for the support reactions and bending moment at any point for a simply supported beam. **(8×5=40 Marks)**

PART – B

Answer **one** question from **each** Module :

Module – I

9. Using conjugate beam method find the slopes at supports A and B and deflection at free end C of the beam given below. EI is constant. 20



OR

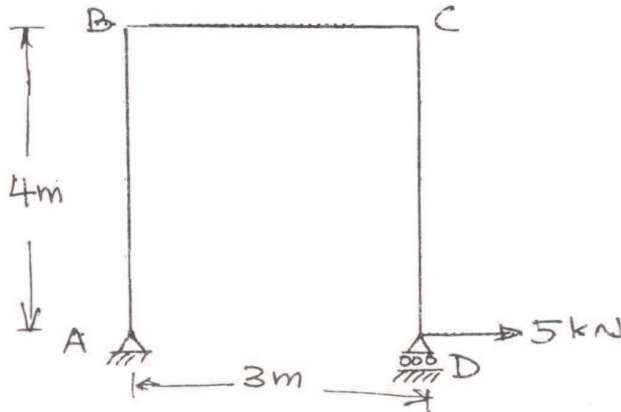
P.T.O.



10. Determine the horizontal displacement at the roller of the portal frame by strain energy method.

Take $EI = 8000 \text{ kN} - \text{m}^2$ throughout.

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Module - II

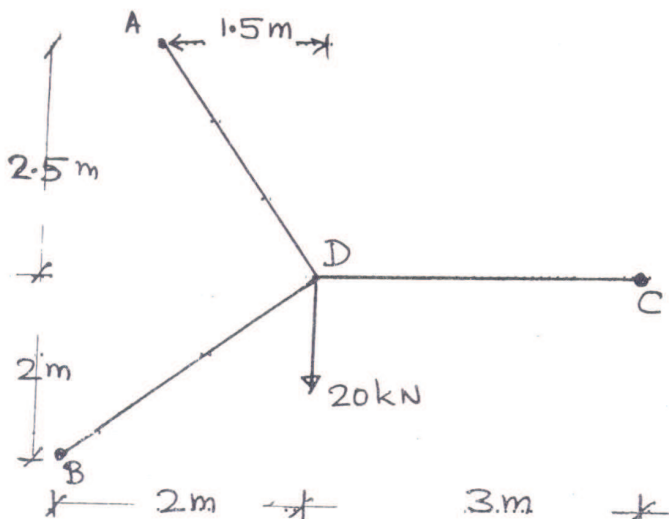
11. A three hinged parabolic arch hinged at the supports and the crown has a span of 24m and a central rise of 4m. It carries a concentrated load of 50kN at 18 m from left support and a u.d.l. of 30 kN/m over the left half portion. Determine moment, thrust and radial shear at a Section 6m from the left support.

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OR

12. Fig. below shows the plan of a tripod, the points A, B and C being in the same horizontal plane and joint D being 3m above the ground. A horizontal load of 20 kN is applied at D as shown. Find the forces in the members assuming that all joints are pin jointed.

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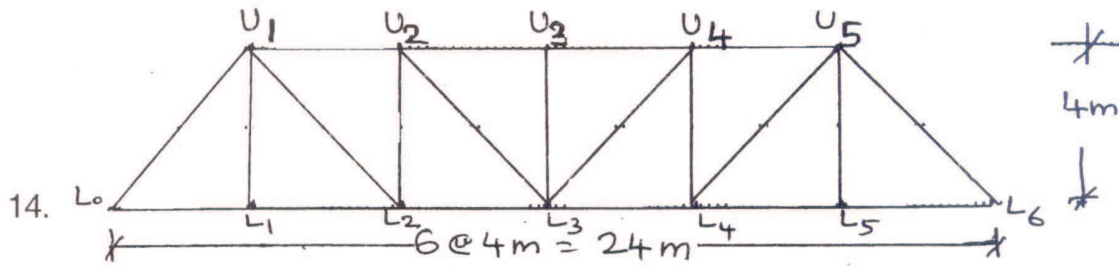




Module – III

13. Determine the maximum bending moment developed anywhere on the girder of span 15 m. due to two rolling loads 150 kN and 100 kN spaced at 4m apart with the 100 kN load leading passing over the girder. Find the equivalent u.d.l. to give the same maximum bending moment. 20

OR



Draw the I.L.D. for member forces in $U_2 L_2$, $U_2 L_3$, $U_2 U_3$ and $L_2 L_3$.

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