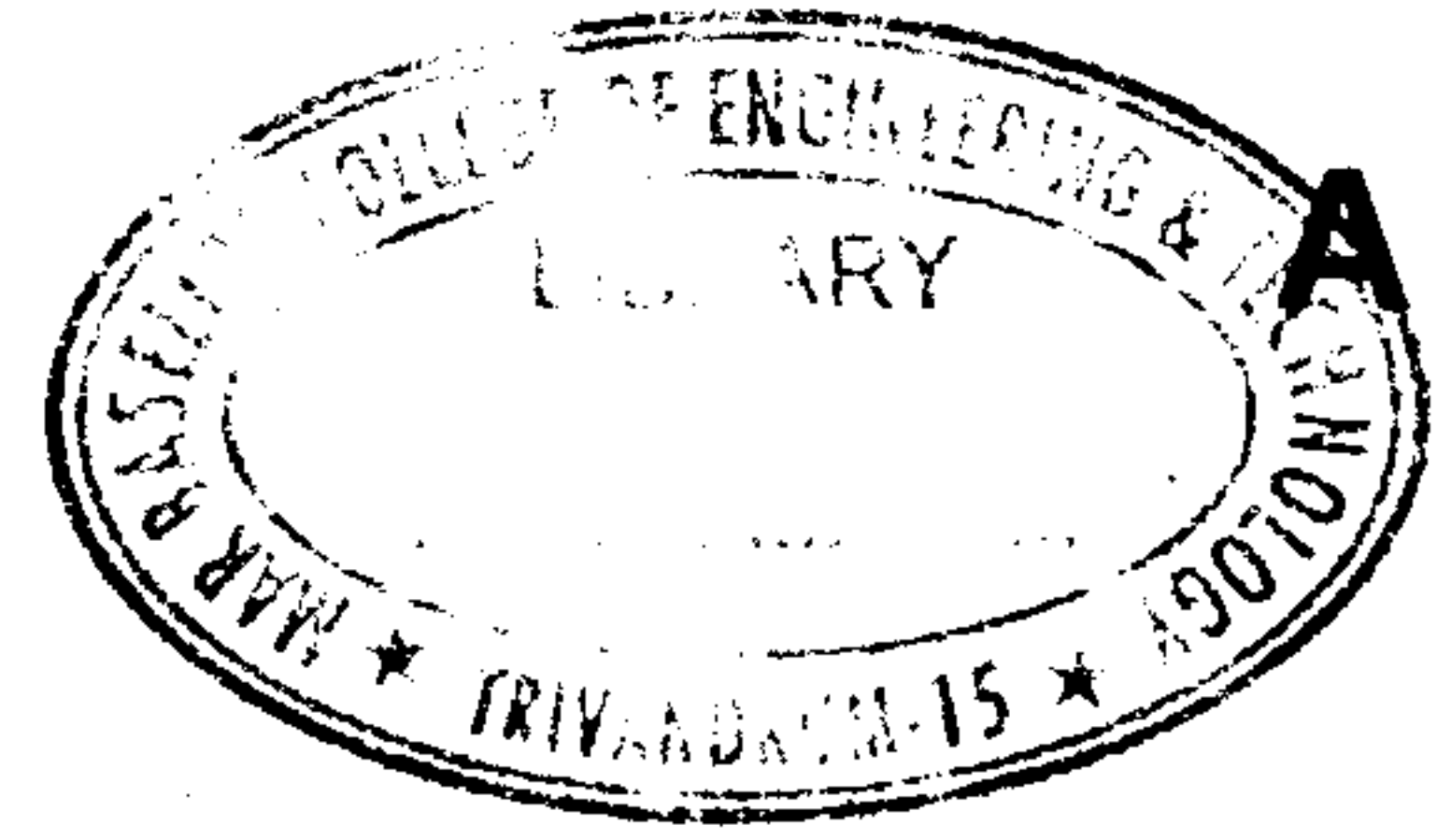




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A – 6327

Reg. No. :

Name :

**Third Semester B.Tech. Degree Examination, September 2016
(2008 Scheme)**

08.304 : MECHANICS OF SOLIDS (SMPU)

Time : 3 Hours

Max. Marks : 100

Instruction: Answer *all* questions from Part A and *one* question from *each* module in Part B.

PART – A

(10×4=40 Marks)

1. Describe the concept of stress and strain with an example.
2. Derive the relation for change in length in a tapered circular bar of diameter d and length l carrying a load of P .
3. Explain the concept of temperature stress.
4. Derive the relationship between bending moment and shear force in a beam.
5. Explain the assumptions made in deriving torsion formula.
6. Explain the method of section in analyzing a perfect frame.
7. What do you mean by kern of the section ?
8. Explain the assumptions made in Euler's equation for a slender column.
9. Describe the term resilience.
10. Explain steps involved in M'Caualays method with a simple example.

PART – B

(3×20=60 Marks)

Module – I

11. a) Calculate the change in length of a RCC column of size 600 mm by 600 mm consisting of four bars of 16 mm diameter. It is carrying a load of 1500 KN passing through the centroid of the column section. The ratio of E_s to E_c is 18. Length of the column is 4 m. E_s is 2×10^5 MPa.

OR

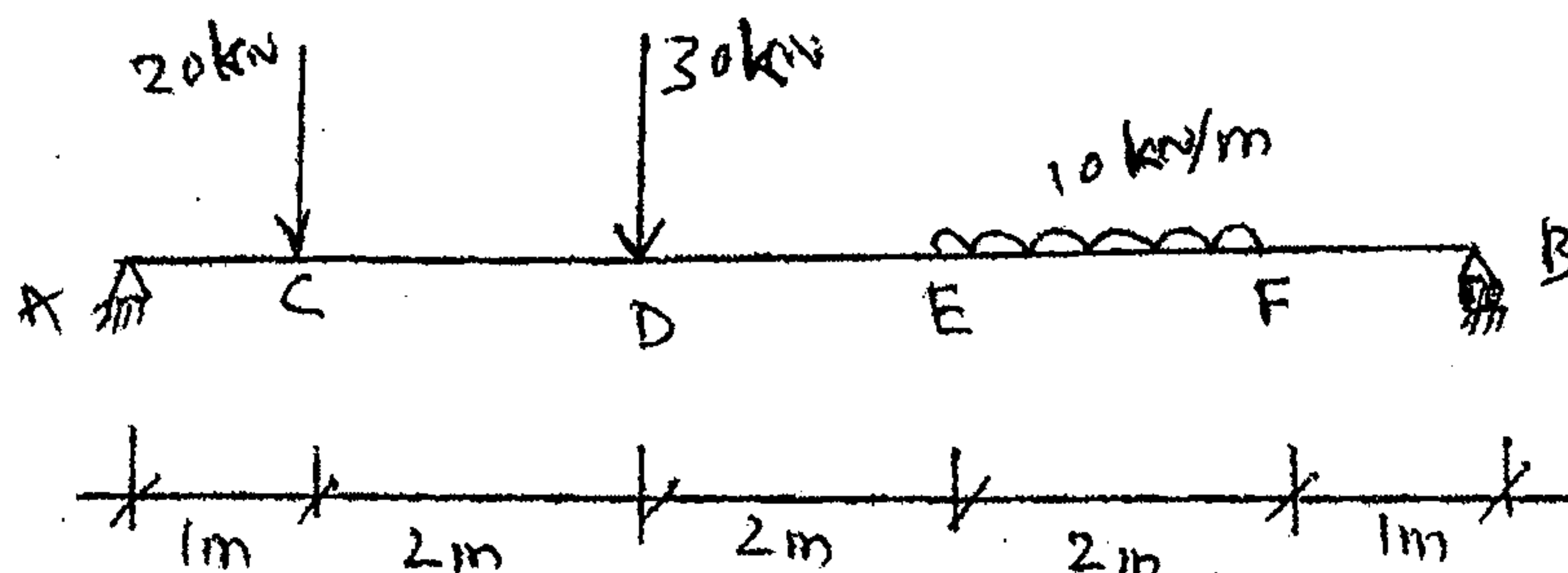
- b) Determine maximum and minimum principal stresses in a wooden block subjected to two tensile stresses 120 MPa and 70 MPa along with a shear stress of 45 MPa. Verify answer using Mohr's circle.

P.T.O.



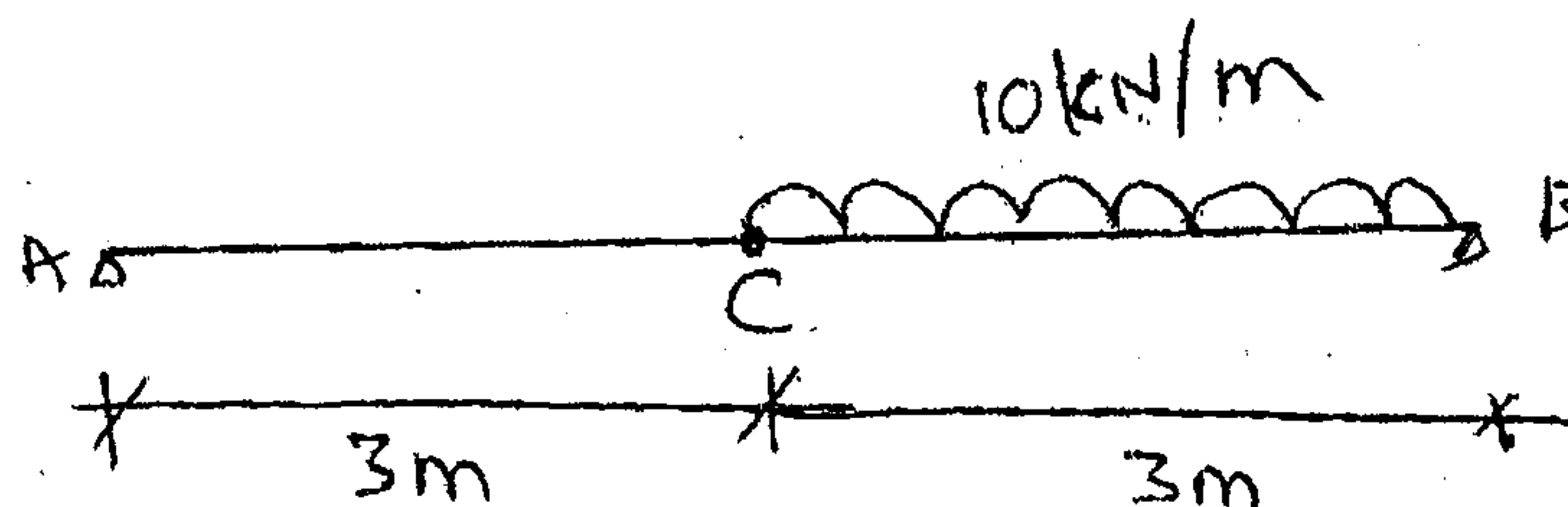
Module - II

12. a) Determine the value of SF and BM and draw the figures for a beam shown below :



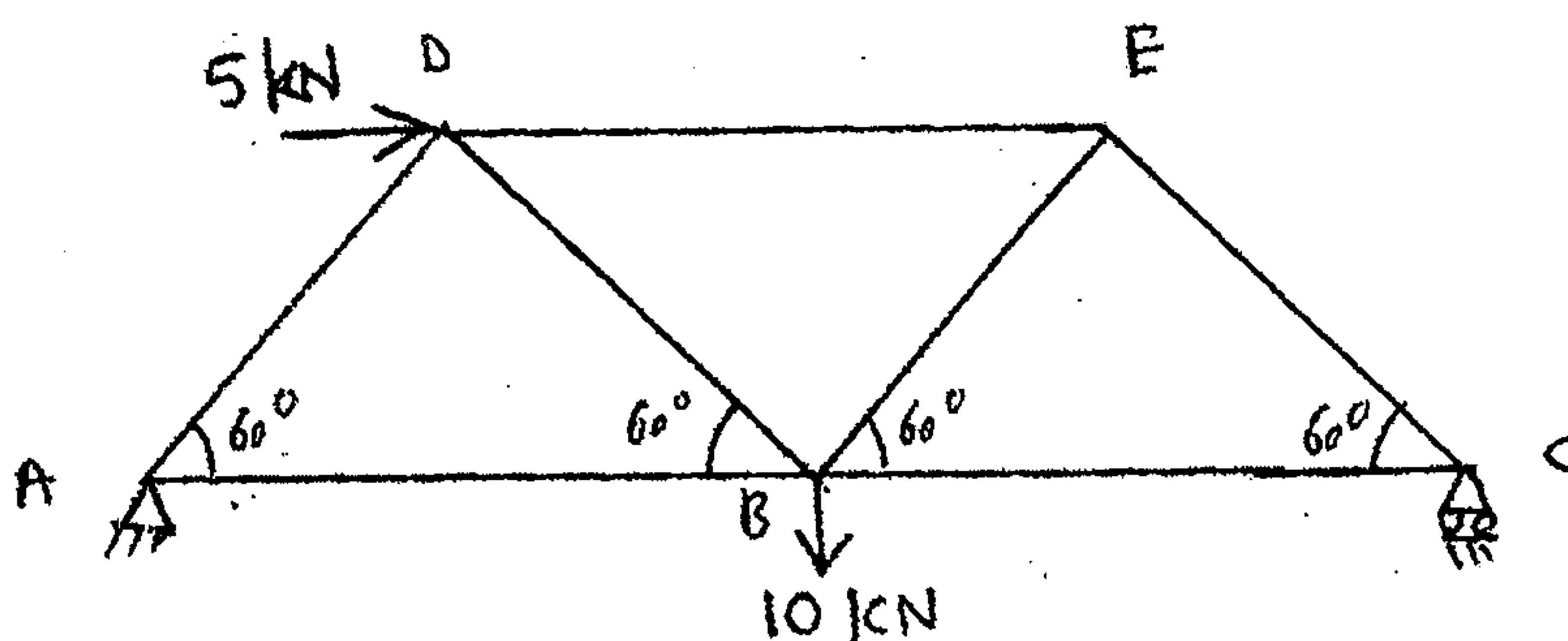
OR

b) Calculate the deflection at point C of a ss beam shown below :



Module - III

13. a) Analyse the plane perfect frame shown below using method of joints



OR

b) Compare the strength of a solid shaft with a hollow one having internal diameter to external diameter ratio of 0.65. The two shafts are made up of same material and they have same length and area of cross section.