

Pg 1/3

SE - Mech.
Sem III (CBSSGS)
SOM.

02/12/2014

QP Code :14593

Time: - 3 hrs.

Maximum Marks:- 80

N. B.

1. Question no. 1 is compulsory.
2. Answer any THREE out of the remaining FIVE questions.
3. Assumption made should be clearly stated.
4. Assume any suitable data wherever required but justify the same.
5. Answer to the questions should be grouped and written together.

Q1

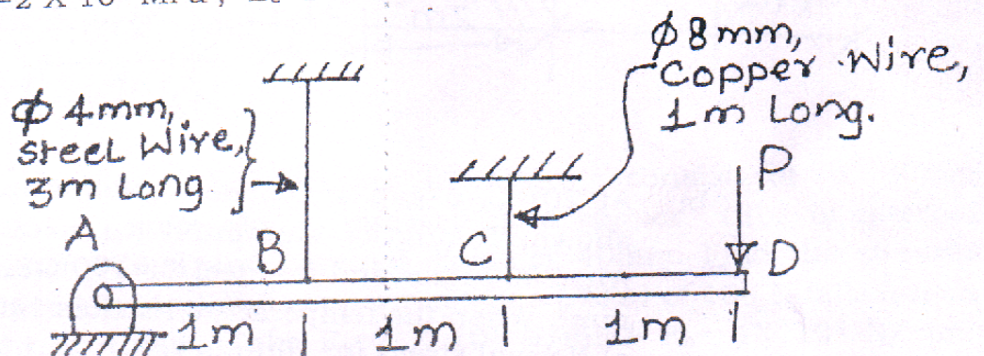
Answer any four

20

- a) A circular log of timber has diameter D . Find the dimensions of strongest rectangular section to resist moment, one can cut from this log.
- b) Explain beams of Uniform strength.
- c) Derive expression for deformation of uniformly Tapering Rectangular section bar.
- d) State at least three differences between Torque and Bending Moment.
- e) State the assumption made in theory of torsion.

Q.2

- a) Find the value of P , stress in steel and copper wires if the rigid beam AD rotates clockwise causing a deflection of 3 mm at the D .
 $E_s = 2 \times 10^5$ MPa, $E_c = 1 \times 10^5$ MPa. (10)



- b) A short hollow cylindrical column carries a compressive load of 450kN. Determine the maximum permissible eccentricity of load, if the allowable compressive stress is 75N/mm^2 & allowable tensile stress is 20N/mm^2 . The external and internal diameters are 200mm and 125mm respectively. Draw the variation of actual resultant stress across the section of the column. (10)