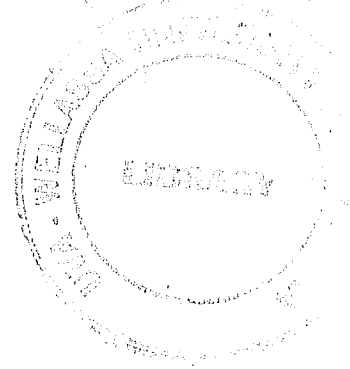




Uva Wellassa University, Sri Lanka  
Btech. Degree Programme  
End Semester Examination- Semester 1  
January -2009



SCT 368-1 Strength of Materials I

Answer Three (3) questions only

Time: One (01) hour

Q1.

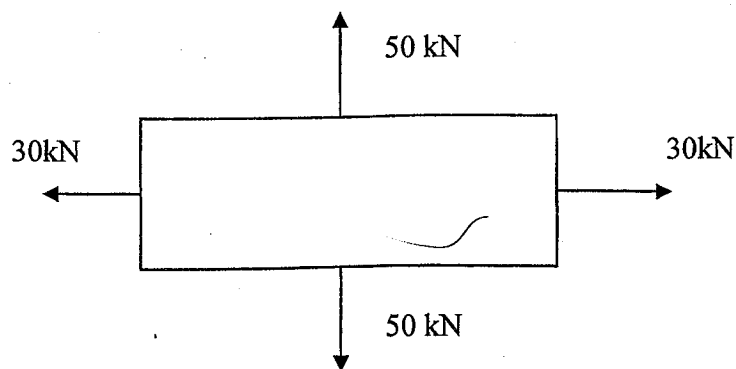
1. With the standard notations define the Hook's law.
2. Explain the procedure to carry out a Standard Tensile test.
3. Starting from Hook's law derive the equation for extension.
4. A flat plate of steel, 6 cm thick, and of trapezoidal form tapers from 50 cm width to 60 cm width in a length of 140 cm. Determine the elongation under an axial force of 50 kN.  $E = 2.23 \times 10^7 \text{ N/cm}^2$ .

Q2.

1. Using the principle of superposition, show that the resultant strain in x- direction is.

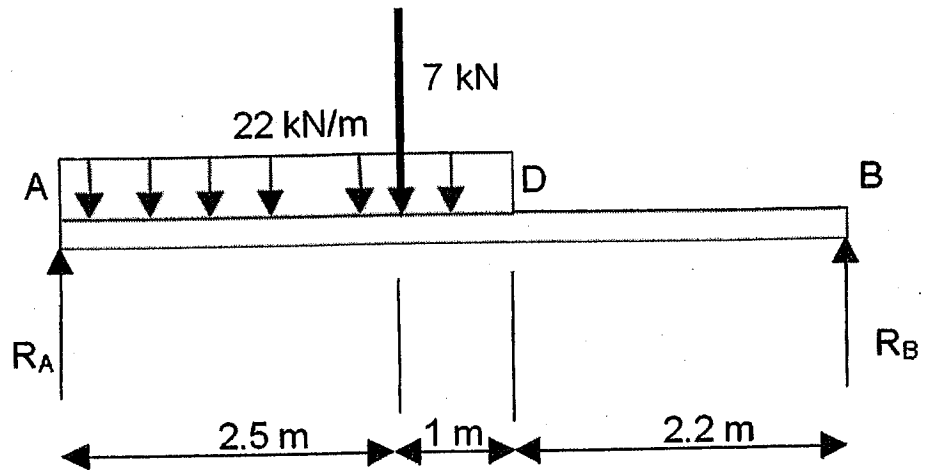
$$\epsilon_x = \frac{1}{E} \{ \sigma_x - \nu (\sigma_y + \sigma_z) \}$$

2. A plate of uniform thickness 12 cm and dimension 6 x 20 cm is acted upon by the loads shown. Taking  $E = 2.28 \times 10^7 \text{ N/cm}^2$ , determine  $\epsilon_x$  and  $\epsilon_y$ . The poisson's ratio is 0.3.



Q3.

1. For the beam AB shown in figure below, draw shear force and bending moment diagrams.



2. With the help of the two diagrams explain the shear stress variation in the beam.

Q4. Write short notes selecting **FOUR** topics from list below.

1. Proof stress.
2. Impact Testing.
3. Plain stress and plain strain.
4. Statically determinate structure.
5. Hoops stress