Code No: RT21013 **R13** SET - 1

II B. Tech I Semester Supplementary Examinations, October/November - 2019
STRENGTH OF MATERIALS - I
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A

1. a) Define resilience. (3M)
   b) Derive the relation between SF, BM and rate of loading. (4M)
   c) What is the section modulus of an I section. (4M)
   d) Draw the shear stress distribution diagram for a T beam. (3M)
   e) Write the steps involved in Macaulay's method. (4M)
   f) Derive the circumferential stress of thin cylinder. (4M)

PART –B

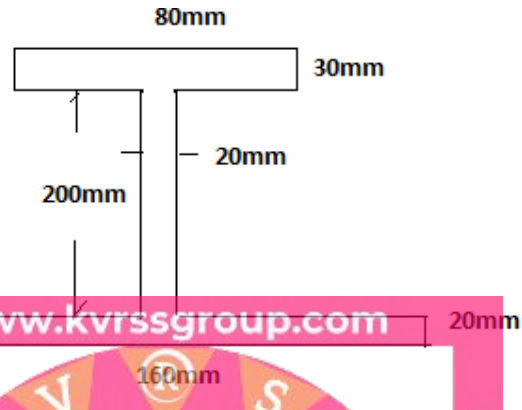
2. a) A specimen of steel 25mm diameter with a guage length of 200mm is tested to destruction .It has an extension of 0.16mm under a load of 80kN and the load at elastic limit is 160kN .The maximum load is 180kN.The total extension at fracture is 56mm and diameter at neck is 18mm. Find the (i) stress at elastic limit (ii) Young's modulus (iii) Percentage of elongation (iv) Percentage of reduction in area and (v) Ultimate tensile stress. (10M)
   b) Derive the expression of strain energy for sudden loading. (6M)

3. a) Draw SFD and BMD for the beam shown below (12M)

   b) Draw the SFD for a cantilever carrying Uniformly Varying Load on the whole span. (4M)

4. Derive the equation M/I = f/y =E/R (16M)
~~~~~~

5. An unsymmetrical I section shown in the figure is subjected to a shear force of 40kN. Draw the shear stress variation diagram across the depth. (16M)



6. An overhanging beam ABC supported at A and B is loaded as shown in the figure Determine the deflection at free end C and the maximum deflection between A and B. (16M)

7. A pipe of 400 mm internal diameter and 100mm thickness contains a fluid pressure 80N/mm^2. Find the maximum and minimum hoop stresses across the section, Also sketch the radial and hoop stress distribution across the section. (16M)