Code No: R22012 **R10** SET - 1

**II B. Tech II Semester Supplementary Examinations, April/May-2017**
**STRENGTH OF MATERIALS**
(Civil Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. Derive the relation between slope deflection and radius of curvature. (15M)

2. A steel cylinder 0f 300mm external diameter is to be shrunk to another steel cylinder of 150mm internal diameter. After shrinking the diameter at the junction is 250mm and radial pressure at the common junction is 28N/mm$^2$.Find the original difference in radii at the junction. Take E = 2 x 10$^5$ N/mm$^2$ (15M)

3. a) Derive an expression for the major and minor principle stresses on an oblique plane when the body is subjected to direct stresses in two mutually perpendicular directions. (8M)
   b) Define and explain the maximum strain energy theory of failure. (7M)

4. Derive the torsion equation. (15M)

5. a) Derive the Euler's equation for the columns fixed at both ends. (12M)
   b) What are the assumptions of Euler's theory? (3M)

6. a) What is middle third rule of rectangular section? (7M)
   b) Find an expression for the maximum and minimum stresses when a rectangular column is subjected to a load which is eccentric to y-y axis. (8M)
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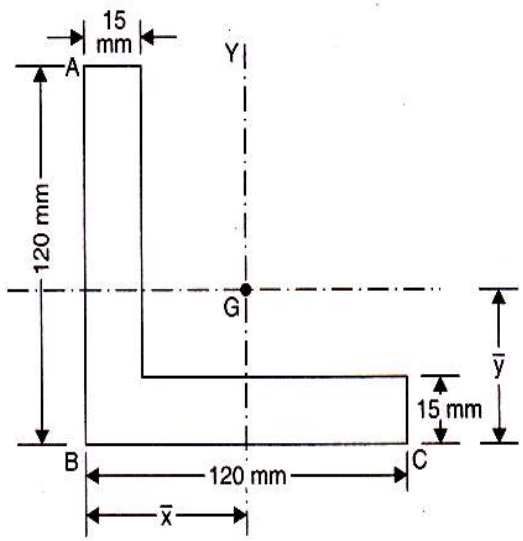
7. A simply supported beam of span 3.6m carries a load of 600N at its centre. The section of the beam is an angle as shown in the fig below The load of the line passes through the centriod of the section and is along line YG. Determine the stresses at the points A, B and C of mid section of the beam and deflection of the beam at the midpoint. (15M)




8. Find the reactions and forces in the member of the truss shown below (15M)