Code No: RT22013 **R13** SET - 1

II B. Tech II Semester Supplementary Examinations, November-2018
STRENGTH OF MATERIALS - II
(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**

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PART –A

1. a) Define Principal stresses & Principal strains (4M)
b) Write Torsion equation and mention each term in the equation (3M)
c) What are the important end conditions of columns? (4M)
d) Write the types of retaining walls (4M)
e) Define the centroidal principal axes of a section (4M)
f) Define determinacy (3M)

PART -B

2. In a steel member, at a point the major principal stress is 180 MN/m^2 and the minor principal stresses is compressive. If the tensile yield point of the steel is 225 MN/m^2, find the value of the minor principal stress at which yielding will commence, according to each of the following criteria of failure. (16M)
(i) Maximum shearing stress
(ii) Maximum total strain energy
(iii) Maximum shear strain energy
Take Poisson's ratio = 0.26

3. A solid shaft has to transmit 75 kW at 200rpm. Taking allowable shear stress as 75N/m^2 , find suitable diameter for the shaft, if the maximum torque transmitted on each revolution exceed the mean by 25%. (16M)
(b) A closed coiled helical spring made of 6mm diameter steel wire has 20 coils, each of 100mm mean diameter, when subjected to axial loads of 70N, Calculate
(i) The maximum shear stress produced
(ii) The deflection
(iii) The energy stored.
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4. a) Derive the expression for crippling load when the both ends of the column are hinged. (8+8M)
   b) Derive the Prof. Perry's formula.

5. Determine stresses in case of Retaining wall with suitable example (16M)

6. Determine the principal moments of inertia for an unequal angle section 80x60x10*mm* What do you understand by centroidal principal axes and principal moments of inertia Obtain the principal moment of inertia for an unequal angle section 200*mm* x150*mm* x10*mm* (16M)

7. Find the forces in the members of truss by method of joints as shown in Fig (16M)