H.T.No. | | | | | | | | | | |

Code No: CE1510 **GEC-R14**

II B. Tech II Semester Regular Examinations, April 2017

MECHANICS OF SOLIDS - II

(Civil Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. A point in a strained material is subjected to two mutually perpendicular stresses of 200N/mm^2 and 100N/mm^2, but the stresses being tensile in nature. Determine the normal and resultant stresses on an oblique plane inclined at 30^o to the axis of the minor axis
2. State Maximum shear stress theory.
3. What are the laterally loaded struts?
4. What are the different methods used for finding deflection and slope of beam?
5. A thin cylindrical vessel of a mean dia 'D' and of length 'L' closed at both ends subjected to a water pressure 'P' the value of hoop stress and longitudinal stress in the shell respectively?
6. Write a short note of deflection of beams in unsymmetrical bending.

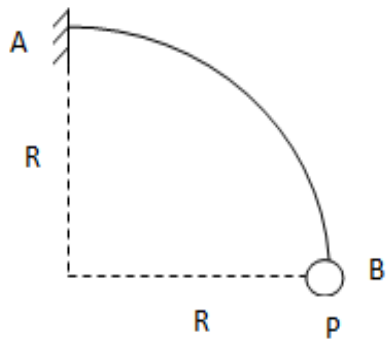
PART-B

4 × 12 = 48M

1. a) Define principal planes and principal stresses. (4M)
   b) A point in a strained material is subjected to a tensile stress of 120 MPa and a clock wise shear stress of 40 MPa. What are the values of normal and shear stresses on a plane inclined at 45^o with the normal to the tensile stress. (8M)
2. A beam of uniform cross section and of length l carries a uniformly distributed load w/unit length. It is simply supported at the left hand end and at a point l/4 meters inside the right hand end. Find the deflection of the overhanging end using Unit load method. (12M)
3. A Strut,30 mm diameter and 2.2 m long is hinged at both ends .it carries a UDLoad of 60 N/m in addition to an axial thrust of 8000N .Calculate the maximum stress. E=200 GPa. (12M)

4. A beam AB of length 8m is simply supported at its ends and carries two point loads of 50kN and 60kN at a dist of 3m and 5m from left support respectively. Determine a) the deflection under each load b) maximum deflection. Take E= 2 x 10^5 N/mm^2 and I = 8.5 x 10^6 mm^4. (12M)
5. Find the thickness of metal necessary for a cylindrical shell of internal diameter 150mm to withstand an internal pressure of 50N/mm^2.The maximum hoop stress in the section is not to exceed 150N/mm^2. (12M)
6. A quarter circle beam of radius R curved in plan is fixed at end A and free at end B as shown in fig. It carries a vertical load P at its free end. Determine the deflection at the free end and also sketch the shear force, bending moment and torsional moment diagram. Assume flexural rigidity (EI) = torsional rigidity (GJ)

(12M)



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