Roll No. | | | | | | | | | | | | |

Total No. of Pages : 01

Total No. of Questions : 08

M.Tech. Civil Engg (2016 Batch) EL-I (Sem.–2)

INTRODUCTION TO THE THEORY OF PLASTICITY

Subject Code : MTEC-209

M.Code : 74302

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) What is Bauschinger effect on steel? (8)

   b) Write in detail about 1D plasticity and viscoplasticity. (12)

2. Differentiate between Tresca and Von-Mises yield criteria. Explain in detail. (20)

3. Derive the expression for tension of a circular bar in a elastic-perfectly-plastic materials under incipient yielding, elastic-plastic and fully plastic cases. (20)

4. a) Explain in detail true stress- strain diagram. (10)

   b) Write a short note on following : (10)

      i) Concept of plastic potential.

      ii) State assumptions in yield criteria.

5. A walled tube of mean radius 100mm and wall thickness 4mm is subjected to a torque of 10 N-m. If the yield strength of the tube materials is 120N/mm^2, determine the value of axial load applied to the tube so that the tube starts yielding according to Von-Mises criteria. (20)

6. Derive the associated flow rule and plastic dissipation for the Drucker-Prager yield criteria. (20)

7. Describe in detail the slip line field theory. Also write the assumptions in plasticity. (20)

8. Write short notes on following : (20)

   a) Shake down analysis

   b) Drucker's Postulate

   c) Visco-plastic potentials

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.