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

Total No. of Pages : 01

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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.