

**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. Sem. – II<sup>nd</sup> - Examination – June/July- 2011****Subject code: 1722801****Subject Name: Mechanics of Metal Forming****Date: 22/06/2011****Time: 10:30 am – 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What do you mean by Yield Condition? **07**  
(b) Derive the relationship between yield strength in Shear and Yield strength in tension according to Tresca's hypothesis. **07**

- Q.2** (a) State the Fundamental condition for Stress-Strain relations in plastic deformation. **07**  
(b) Why most metals obey Von-Mises Yield condition? Explain it. **07**

**OR**

- (b) Define Incremental Plastic Strain **07**

- Q.3** (a) What is the importance of Bulge Test? Explain it. **07**  
(b) Explain about Instability in Tension. **07**

**OR**

- Q.3** (a) Explain about importance of Upper bound and Lower bound theorem in forging. **07**  
(b) Explain about effect of Strain Rate. **07**

- Q.4** (a) Define Plane Strain. Show the relationship between  $\alpha$  and  $\beta$  slip lines. **07**  
(b) Prove  $P=2K-\sigma_x$ , By Slab Analysis for Sheet Drawing. **07**

**OR**

- Q.4** (a) Define Strain Rate and Super Plasticity. **07**  
(b) Explain the application of Upper bound theorem with suitable example. **07**

- Q.5** (a) List out CAD/CAM application in Extrusion, Forging and Sheet Metal Forming. **07**  
(b) Explain about Hills Anisotropic Plasticity Theory. **07**

**OR**

- Q.5** (a) Explain Bending in Sheet Metal Forming Also show the various stresses in Bending Process. **07**  
(b) Explain about Hills Anisotropic Plasticity Theory. **07**

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