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**Fifth Semester B.E. Degree Examination, June/July 2016**

**Manufacturing Process – III**



Max. Marks: 100

**Note:** Answer FIVE full questions, selecting at least TWO questions from each part.

**PART – A**

- 1 a. Give the broad classification of metal working processes. (04 Marks)
- b. Explain Tresca and Von-Mises yield criteria. (08 Marks)
- c. The state of stress at a point is given by,  $\sigma_x = 70$  MPa,  $\sigma_y = 120$  MPa,  $\tau_{xy} = 35$  MPa. If the yield strength of the material is 125 MPa, determine in a uniaxial tensile test, whether yielding will occur according to Tresca's and Von-Mises yield conditions or not. (08 Marks)
- 2 a. List and explain various process parameters affecting on the metal working processes. (10 Marks)
- b. Define and explain the concept of workability. (06 Marks)
- c. Write a note on deformation zone geometry. (04 Marks)
- 3 a. With simple sketches, explain different types of forging operations. (08 Marks)
- b. Explain various die-design parameters. (06 Marks)
- c. A block of lead  $25\text{mm} \times 25\text{mm} \times 150\text{mm}$  is pressed between flat dies to a size of  $6.25\text{mm} \times 100\text{mm} \times 150\text{mm}$ . If the uniaxial flow stress is  $\sigma_0 = 6.9$  MPa and  $\mu = 0.25$ . Determine the pressure distribution over the 100 mm dimension. (06 Marks)
- 4 a. List and explain different types of rolling mills. (10 Marks)
- b. Briefly explain different types of rolling variables. (05 Marks)
- c. What are the problems and defects occurred in rolled products? (05 Marks)

**PART – B**

- 5 a. With a simple sketches, explain the drawing die. (05 Marks)
- b. List and explain different methods of tube drawing. (10 Marks)
- c. What is the percentage contribution of friction to the drawing stress at 40% reduction of area using two lubricants having co-efficient of friction value,  $\mu = 0.05$  and  $\mu = 0.1$  with  $\alpha = 15^\circ$  die and a fixed parallel plug. (05 Marks)
- 6 a. Sketch and explain basic types of extrusion. (10 Marks)
- b. Explain the different methods used in the production of seamless pipes and tubes. (10 Marks)
- 7 a. Sketch and explain a progressive die used for the production of washer. (08 Marks)
- b. Explain how a cylindrical cup is formed. (06 Marks)
- c. Explain the concept of forming limit criteria. (06 Marks)
- 8 a. Sketch and explain explosive forming. (06 Marks)
- b. Explain the different methods used for the production of metal powders in powder metallurgy. (08 Marks)
- c. List the advantages, limitations and applications of powder metallurgy. (06 Marks)