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B.E/ B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS. APRIL/MAY 2012
MATERIALS SCIENCE AND ENGINEERING
FIFTH SEMESTER

ML9301 – THEORY AND APPLICATION OF METAL FORMING

(REGULATIONS 2008)

Time: 3 Hrs

Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. Define true stress and true strain.
2. State Stress Tensor.
3. What is meant by slip?
4. What is workability?
5. Classify the rolling mills?
6. Name the various defects in forging.
7. What are the variables affecting extrusion?
8. What are the fundamental difference between wire drawing and tube drawing?
9. Define fine blanking.
10. Name the various explosives used in explosive forming.

Part –B (5 x 16 = 80 Marks)

11. What is meant by yield criteria? Describe the Von Mises and Tresca Yield criteria. (16)
12. a. (i) How to determine flow stress? (08)
(ii) Explain the effect of temperature, strain rate and metallurgical structure on metal working. (08)

Or

- b. (i) Derive an expression for sticking friction. (08)
- (ii) Describe the impact of residual stresses in metal forming. (08)
- 13 a. Distinguish between open die forging and closed die forging. Derive an expression for forging in plane strain. (16)
- Or
- b. (i) Explain the various rolling defects, their causes and remedies. (08)
- (ii) Derive an expression for forces and geometrical relationship in rolling. (08)
14. a. (i) Describe about the hydrostatic extrusion with neat sketches. (08)
- (ii) Describe the various deformation patterns in extrusion process. (08)
- Or
- b. (i) Derive an expression for forward extrusion process. (08)
- (ii) Explain the various methods for production of seamless tubes. (08)
- 15 a. Write short notes on
1. Stretch forming
 2. Deep drawing
 3. Blanking
 4. Formability Limit Diagram (16)
- Or
- b. (i) Explain the basic principle of Electro-Magnetic forming with a neat sketch. (08)
- (ii) Explain the basic principle of Electro-Hydraulic forming with neat sketches. (08)