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B.E DEGREE END SEMESTER EXAMINATIONS

Apr- May 2011

B.E. Material Science and Engineering

V SEMESTER

ML9301 – THEORY & APPLICATIONS OF METAL FORMING (R 2008)

Time: 3 Hrs

Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. Define the term Stress deviator.
2. What is meant by Principle stress?
3. List down the effect of temperature on flow / yield stress.
4. Define the term workability.
5. Write the characteristics of closed die forging.
6. What is meant by cluster rolling?
7. Define the term Impact Extrusion.
8. What are the variables affecting the extrusion process?
9. What is the use of FLD diagram?
10. State the application of Electromagnetic forming?

Part –B (5 x 16 = 80 Marks)

11. (i). Define the term yield criteria. Derive an expression, when yielding will occur in a material according to Von Mises. (12)
(ii). Derive the relationship between true strain and engineering strain. (4)
 12. (a) How forming processes are classified based upon the stress. Explain them in detail with a neat sketch. (16)
- (OR)
- (b) What is meant by deformation zone geometry? Derive an expression for determining the deformation thickness in forging process. (16)
 - 13 (a) How forging process are classified? Explain any two forging press in detail with a neat sketch. (16)

(OR)

- (b) (i). How rolling mills are classified and explain them with a neat sketch. (12)
(ii). What are the various defects in rolling? Explain in detail about any two (4)
rolling defects along with their causes and remedies.

14. (a) (i). Differentiate between forward and backward extrusion. (8)
(ii). Explain with a neat sketch the working of hydrostatic extrusion. Also list (8)
down their advantages and applications.

(OR)

- (b) (i). Describe the various methods of manufacturing seamless pipe. (8)
(ii). Derive an expression for determining the drawing force in drawing a (8)
rod.

- 15 (a) (i). Define the term formability. (4)
(ii). Write a short notes on various sheet metal forming operations. (12)

(OR)

- (b) (i). Define the term high energy rate forming. (4)
(ii). Explain with a neat sketch the working of explosive forming process (12)
along with the various process variables.