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B.E (Full Time) DEGREE END SEMESTER EXAMINATIONS. NOV/DEC 2011

MATERIALS SCIENCE and ENGINEERING BRANCH

FIFTH SEMESTER

ML9301 – THEORY AND APPLICATIONS OF METAL FORMING

(REGULATIONS 2008)

Time: 3 Hrs

Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. State the main advantages of true stress-strain diagram.
2. Define Stress Tensor.
3. What is meant by slip?
4. State the advantages of lubrication in the metal working process.
5. Name the various forging defects.
6. What is the effect of residual stresses in forging?
7. State the important variables affecting the extrusion process.
8. State the applications of Hydrostatic extrusion?
9. Define stretch forming.
10. What are the important variables for Electromagnetic forming process?

Part –B (5 x 16 = 80 Marks)

11. What do you understand by yield criteria?. Explain the two yield criteria's commonly used? (16)
12. a. (i) What is meant by strain rate? (04)
(ii) How metal forming process are classified. Explain briefly. (12)

Or

- b. Write the short notes on following.
- (i) Workability (05)
 - (ii) Twinning (05)
 - (iii) Friction in metal working process. (06)
- 13 a. (i) Differentiate between the open die forging and closed die forging process with suitable examples. (08)
- (ii) Explain the working principle of pneumatic press used in forging process with neat sketch. (08)
- Or
- b. (i) Determine the various rolling defects, and remedies with neat sketch. (06)
- (ii) Determine the rolling pressure distribution in strip rolling process with neat sketch. (10)
14. a. (i) Differentiate between the direct extrusion and indirect extrusion process. (08)
- (ii) How deformation patterns are classified. Explain with neat sketch. (08)
- Or
- b. With a neat sketch explain various methods of producing tubes using extrusion process. State its advantages. (16)
- 15 a. What is meant by sheet metal formability? State the importance of formability limit diagram with neat sketch. (16)
- Or
- b. Explain the working principle of Electro-Hydraulic forming process With neat sketch. Write its advantages, applications and limitations. (16)