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B.E. DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011

MECHANICAL ENGINEERING BRANCH

SEVENTH SEMESTER (Elective)

ME 9041 – THEORY OF METAL FORMING

(REGULATIONS 2008)

Time: 3 Hrs

Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. What is meant by strain tensor?
 2. State Hooke's law.
 3. State the advantages of uniaxial tension test.
 4. Define work hardening.
 5. State the main difference of cold forging and hot forging.
 6. What is meant by elasto plasticity?
 7. Name the various process parameters of superplastic forming.
 8. Define drawing process.
 9. State the advantages of isothermal forging.
 10. List the applications of rubber pad forming.
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11.
 - (i) Define stress tensor (04)
 - (ii) Explain the tresca & vonmises yield criterion theories. (12)
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12. a. With a neat sketch explain the following.
 - (i) Bulge test. (08)
 - (ii) Compression test. (08)
- Or
- b. What is meant by plastic instability? Explain the plastic instability in uniaxial tension & biaxial tension stress. (16)

- 13 a. Discuss the following metal forming analysis. (08)
- (i) Slab analysis (08)
 - (ii) Upper bound solutions. (08)

Or

- b. Derive an expression for forging of a plate of constant thickness under conditions of plane strain. (16)

14. a. With a neat sketch describe the following sheet metal forming methods. (06)
- (i) Deep drawing (06)
 - (ii) Stretch forming (05)
 - (iii) Bending (05)

Or

- b. Explain the working principle of electro hydraulic forming process. Describe its process variables. State its advantages and disadvantages. (16)

15. a. With a neat sketch explain the hot & cold isotropical pressing process. Write its advantages and disadvantages. (16)

Or

- b. What are the various powder metal techniques? Explain any two with a neat sketch. State its advantages. (16)