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06ME73

Seventh Semester B.E. Degree Examination, December 2010
Manufacturing Processes - III

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from Part – A and Part - B.

PART - A

- 1 a. With neat sketches, explain the classification of metal working processes on the basis of force applied. (10 Marks)
- b. Explain : i) Tresca's yield criterion and ii) Von – Mises yield criterion. (10 Marks)
- 2 a. Explain with a neat sketch, the hydrostatic pressure in metal working. (05 Marks)
- b. Discuss the concept of deformation zone geometry, in metal working. (05 Marks)
- c. Explain the effect of the following on metal working processes : (10 Marks)
 - i) Strain rate
 - ii) Temperature.
- 3 a. Deduce the expression for forging pressure and load in open – die forging by slab analysis making suitable assumptions. (10 Marks)
- b. A circular disc of 150mm radius and thickness 50mm is forged to half its original thickness by open – die forging. Determine the maximum forging force, if the coefficient of friction between the job and the die is 0.25. The average shear yield stress is 4 N/mm². (05 Marks)
- c. Explain typical forging defects. (05 Marks)
- 4 a. With neat sketches, explain the different types of rolling mills. (08 Marks)
- b. Describe the effect of front and back tension on the rolling load. (06 Marks)
- c. Calculate the rolling load if a steel sheet is hot rolled 40% from a 40mm thick slab using 900mm diameter rolls. The slab is 760mm wide. Assume $\mu = 0.3$. The plane strain flow stress is 140 MPa at the entrance and 200 MPa at the exit from the roll gap due to increasing velocity. What would be the rolling load, if sticking friction occurs? (06 Marks)

PART - B

- 5 a. With a neat sketch, explain tube drawing process. (06 Marks)
- b. Explain optimal cone angle and dead zone formation in drawing. (06 Marks)
- c. What is meant by redundant work in drawing process? Explain. (08 Marks)
- 6 a. Explain backward extrusion process with a neat sketch. (06 Marks)
- b. Write a note on extrusion equipment, die design and lubrication. (06 Marks)
- c. Explain the manufacture of seamless tubes with a neat sketch. (08 Marks)
- 7 a. With neat sketches, explain the working of progressive and compound die arrangement in sheet metal working. (10 Marks)
- b. Explain the following operations with neat sketches : i) Rubber forming ii) Stretch forming. (10 Marks)
- 8 a. With a neat sketch, explain the explosive forming process. (06 Marks)
- b. What is powder metallurgy? Explain any 2 methods of metal powder production. (08 Marks)
- c. List the applications of powder metallurgy components. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42, -50, will be treated as malpractice.

