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10ME55

Fifth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Manufacturing Process – III

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Define true stress and true strain. Derive expressions showing the relationship between true stress and engineering stress as well as true strain and engineering strain. (10 Marks)
- b. Explain with a neat sketch the hydrostatic pressure in metal working. (05 Marks)
- c. Write a note on determination of flow stress. (05 Marks)
- 2 a. Explain the effect of the following on metal working processes (i) temperature, (ii) friction and lubrication. (10 Marks)
- b. Write a note on: i) deformation zone geometry, (ii) residual stresses in wrought products. (10 Marks)
- 3 a. With neat sketches, describe various types of forging processes. (06 Marks)
- b. Explain die design parameters in forging, with a neat figure. (08 Marks)
- c. Explain “friction hill concept” and the factors affecting it in forging. (06 Marks)
- 4 a. Explain with neat sketch of rolling mill (i) four high rolling mill, (ii) tandem rolling mill. (10 Marks)
- b. Discuss the effect of front tension and back tension on the rolling process, with neat figures. (08 Marks)
- c. List defects in rolling. (02 Marks)

PART – B

- 5 a. Using neat sketches explain Rod drawing and wire drawing. (08 Marks)
- b. With neat sketch, briefly explain the different features of a drawing die. (04 Marks)
- c. Explain with neat sketches different method of tube drawing. (08 Marks)
- 6 a. Give the classification of extrusion processes and explain any two processes with neat sketch. (10 Marks)
- b. Explain the following:
 - i) Metal flow and deformation during extrusion
 - ii) Defects in extrusion (10 Marks)
- 7 a. With neat sketches, explain combination die and progressive die. List the type of components produced in sheet metal work. (10 Marks)
- b. Write a note on forming limit criteria (Keeler-Goodwin diagram). (05 Marks)
- c. It is required to punch a hole of 10 mm dia in a mild steel plate of 10 mm thickness. Determine whether it is feasible or not, taking shear strength of the plate as 600 N/mm^2 and compressive strength of the punch as 2000 N/mm^2 . If it is not possible, what could be done to produce this hole? (05 Marks)
- 8 a. What is HERF? Explain explosive forming, with a neat figure. (08 Marks)
- b. With a flow chart, explain in detail the powder metallurgy process. (08 Marks)
- c. Explain any two methods of production of metal powder with sketches. (04 Marks)

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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+8 = 50, will be treated as malpractice