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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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