ONE TIME EXIT SCHEME

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10ME55

Fifth Semester B.E. Degree Examination, April 2018
Manufacturing Process – III

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Explain briefly how the different metal working process are classified on the basis of force applied. Draw necessary sketches. **(10 Marks)**

b. Classify and explain the forming processes. **(05 Marks)**

c. Differentiate clearly between wrought product and cast product. **(05 Marks)**

2 a. Explain the effect of following on metal working process:
i) Temperature ii) Friction iii) Lubrication **(06 Marks)**

b. Discuss the occurrence and effect of residual stresses on products obtained by metal working. **(04 Marks)**

c. What is hydrostatic pressure in metal working? Explain with neat diagram. Write the advantages and disadvantages of metal working process. **(10 Marks)**

3 a. Deduce the expression for forging load or force in open die forging system. Considering sticking friction. **(10 Marks)**

b. Explain the parameters of forging die. **(05 Marks)**

c. Mention the forging defects and explain. **(05 Marks)**

4 a. Explain the following rolling mills:
i) Two high mill ii) Four high mill iii) Cluster mill **(10 Marks)**

b. A strip is given 20% reduction in thickness by rolling operation. If its final thickness is 5 mm and roll radius is 500 mm. Determine the position of the neutral plane. Take $\mu = 0.2$ and assume the plane strain condition for rolling. **(10 Marks)**

PART – B

5 a. What is redundant work in drawing? How is it estimated? **(07 Marks)**

b. Write a note on dead zone formation in drawing. **(03 Marks)**

c. It is required to draw an aluminum tube of outside diameter 6 cm and inside diameter 5 cm to 5.8 cm outside diameter and 5 cm inside diameter using a cylindrical mandrel. Find the drawing stress for the following: (i) Ideal condition, (ii) $\mu_1 = \mu_2 = 0.04$ and $\alpha = 30°$. Assume zero back pull and $\sigma_0 = 30$ N/mm^2. **(10 Marks)**

6 a. Give the classification of extrusion process 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. A 75 mm diameter and 200 mm height cup is to be manufactured. Calculate the number of redraws (without annealing). Assume 50%, 30% reduction for successive draws. Use conventional sheet metal. **(10 Marks)**

b. With neat sketches explain combination die and progressive die. **(10 Marks)**

8 a. What is HERF? Explain the principle of working advantages and application of electro hydraulic forming with a neat figure. **(10 Marks)**

b. Write a note on: (i) Compaction, (ii) Sintering, (iii) Blending. **(10 Marks)**

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