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10ME55

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

Manufacturing Process – III

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. ***Missing data may be suitably assumed.***

PART – A

1 a. With a neat sketch, explain classification of metal working processes on the basis of force applied. **(10 Marks)**

b. Explain: i) Trescas yield criterion ii) Von-Mises yield criterion **(10 Marks)**

2 a. Discuss the effect of temperatures in metal forming. **(05 Marks)**

b. Explain the deformation processing system in metal working. **(05 Marks)**

c. What is workability? Explain. **(10 Marks)**

3 a. Explain any five types of forging operations. **(10 Marks)**

b. Discuss the defects in forgings. **(10 Marks)**

4 a. Explain the following methods of rolling with sketch:
i) Three high mill ii) Four high mill
iii) Cluster mill iv) Tandem mill **(10 Marks)**

b. Discuss the effects of front and back tension in rolling. **(10 Marks)**

PART – B

5 a. With neat sketches, explain (i) Rod drawing (ii) Wire drawing. **(10 Marks)**

b. Derive an expression for drawing force. **(05 Marks)**

c. A steel wire is drawn from an initial diameter of 12.5 mm to a final diameter of 10 mm at the speed of 120 m/min. The half cone angle of the die is 6° and the coefficient of friction at the die-wire interface is 0.12. A tensile test on the steel specimen has shown a yield stress of 210 N/mm^2. Determine the draw force and the power required, assuming that there is no back tension applied. **(05 Marks)**

6 a. With a neat sketch, explain the backward extrusion process. **(06 Marks)**

b. With neat sketches, explain the extrusion of seamless tubes, with a fixed mandrel and a floating mandrel in hollow billets. **(10 Marks)**

c. Write a note on extrusion dies. **(04 Marks)**

7 a. Explain the following types of dies used in sheet metal working:
(i) Combination die (ii) Gang die (iii) Follow die **(10 Marks)**

b. With neat sketches, explain the blanking, piercing and bending operations. **(10 Marks)**

8 a. With neat figures, explain the following types of high energy rate forming methods:
i) Contact type explosive forming ii) Electro hydraulic tubular part forming **(10 Marks)**

b. With the help of a block diagram, explain the basic steps in the powder metallurgy process. **(10 Marks)**

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