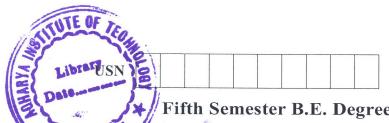
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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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)

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

2 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)

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

Discuss the defects in forgings. (10 Marks)

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

a. With neat sketches, explain (i) Rod drawing (ii) Wire drawing.

(10 Marks)

b. Derive an expression for drawing force.

(i) Combination die

(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/mm². Determine the draw force and the power required, assuming that there is no back tension applied. (05 Marks)

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) (04 Marks)

Write a note on extrusion dies.

(ii) Gang die

Explain the following types of dies used in sheet metal working:

(iii) Follow die (10 Marks)

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

8 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)

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