



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  $6^\circ$  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  $210 \text{ N/mm}^2$ . 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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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.

4 FEB 2020

