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10ME55

**Fifth Semester B.E. Degree Examination, June/July 2018**  
**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. Explain Tresca yield criterion and Von Mises yield criterion with relevant to mathematical expression in terms of Principal stresses. (10 Marks)
- b. Explain the advantages of wrought product over cast and machined products. (05 Marks)
- c. Classify and explain the metal forming processes. (05 Marks)
- 2 a. Explain briefly the variables which influence the metal working processes. (15 Marks)
- b. Explain residual stresses in wrought products. (05 Marks)
- 3 a. Deduce the expression for forging pressure and load in open die forging by slab analysis. (10 Marks)
- b. Explain typical forging defects. (05 Marks)
- c. List and explain die design parameters. (05 Marks)
- 4 a. Classify and explain the different types of rolling mills. (10 Marks)
- b. Calculate the rolling load if a steel sheet is hot rolled 40% from a 400 mm thick slab using 900 mm dia. rolls. The slab is 760 mm wide. Assume  $\mu = 0.3$ , the plane strain flow stress is 140 MPa at the entrance and 200 MPa at the exist from the roll gap due to increasing velocity. What would be the rolling load, if sticking friction occurs. (10 Marks)

**PART – B**

- 5 a. Explain with sketch any two methods of tube drawing. (10 Marks)
- b. Write a note on optimal cone angle and dead zone formation. (05 Marks)
- c. Determine the power required to draw hut steel wire from 12.5 mm to 10 mm in dia. at 100 m/min. The  $\mu$  is 0.1 and the die angle is  $8^\circ$ . Average flow stress is 300 MPa. Also determine the maximum possible reduction. (05 Marks)
- 6 a. Explain with sketch impact extrusion. What are its applications? (09 Marks)
- b. With a neat sketch explain lateral or side extrusion process. (06 Marks)
- c. Explain any six defects in extruded products with reason. (05 Marks)
- 7 a. What are the differences between a compound die and progressive die? Explain with sketches. (10 Marks)
- b. Explain with sketch the following operations in sheet metal forming: (i) Deep drawing (10 Marks)  
(ii) Stretch forming (iii) Rubber press forming.
- 8 a. Explain the different steps involved in powder metallurgy process. (08 Marks)
- b. Explain with a neat sketches : (i) Explosive forming (ii) Electromagnetic forming (12 Marks)  
(iii) Electro hydraulic forming.

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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.