



# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

**Fourth Semester, B.E. - Mechanical Engineering**

**Semester End Examination; May / June - 2019**

**Manufacturing Process - II**

*Time: 3 hrs*

*Max. Marks: 100*

**Note:** i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.  
ii) Missing data, if any, may be suitably assumed.

### UNIT - I

- 1 a. With neat sketches, explain the classification of metal working process on the basis of force applied. 10
- b. Explain the effect of;
- i) Deformation zone geometry                      ii) Friction at die metal interface in metal working process 10
- 2 a. Write a note on : i) Tresca's yield criterion      ii) Von-mises yield criterion. 10
- b. Sketch and explain the hydrostatic pressure in metal working. 6
- c. Define true stress and true strain. 4

### UNIT - II

- 3 a. Deduce the expression for forging pressure and load in open die forging by slab analysis. 10
- b. With neat sketches, explain the defects in forged components. 10
- 4 a. Sketch and explain : i) Tandem mill      ii) Planetary rolling mill. 10
- b. With neat sketches, explain hot rolling and cold rolling. 10

### UNIT - III

- 5 a. Sketch and explain : i) Hydrostatic extrusion      ii) Impact extrusion. 10
- b. Discuss extrusion defects with their causes and remedies. 10
- 6 a. Explain the variables influencing extrusion process. 10
- b. Discuss optimal die angle and dead zone formation in drawing. 10

### UNIT - IV

- 7 a. Explain with neat sketch the working of progressive die arrangement in sheet metal working process. 8
- b. Explain briefly defects in deep drawing process. 4
- c. Explain : i) Forming limit criterion      ii) LDR in drawing. 8
- 8 a. Sketch and explain Open Back Inclined (OBI) press. 8
- b. Sketch and explain: i) Rubber forming      ii) Stretch forming. 12

### UNIT - V

- 9 a. Explain with flow chart the basic steps of powder metallurgy. 10
- b. Explain with sketch any two methods of powder production methods. 10
- 10 a. List the advantages, disadvantages and application of powder metallurgy process. 10
- b. Explain any five characteristics of metal powder. 10