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# 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; August - 2023**

**Manufacturing Process - II**

*Time: 3 hrs* *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

## UNIT - I

1 a. Define metal forming processes and explain basic types of metal forming process with a schematic diagram. 10

b. Distinguish between Wrought products and Cast products. 10

2 a. Write a short note on tresca and von-mises yield criteria. 10

b. List out the advantages, limitation and applications of metal working process. 10

## UNIT - II

3 a. Discuss on various forging processes with suitable sketches. 10

b. Briefly explain the different forging die design parameters. 10

4 a. With neat sketches, explain the defects in rolled products. 10

b. Write a short note on; 10

i) Material flow line in forging ii) Friction hill concept in rolling

## UNIT - III

5 a. Illustrate the method of seamless tube extrusion process. 10

b. With neat sketch, explain the metal flow pattern in extrusion with and without lubrication. 10

6 a. List and explain the process variables of drawing process. 10

b. With a neat sketch, explain the extrusion dies design parameters. 10

## UNIT - IV

7 a. With neat sketches, explain different types of dies used in sheet metal forming. 10

b. A Blanking die is required to handle blanks of 150 mm diameter on 3 mm thick MS sheet. Each blanking takes place is 0.25 seconds and shear strength of the MS sheet is 400 $N/mm^2$. Find the power required. 10

8 a. Discuss on different types of punching. 10

b. With a neat sketch, explain various defects rises during deep drawing. 10

## UNIT - V

9 a. With a neat sketch, explain the principle of powder metallurgy technique. 10

b. List the advantages, limitations and applications of powder metallurgy technique. 10

10 a. Difference cold and hot isostatic pressing methods. 10

b. Explain processing of rubber and elastomers. 10

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