Code: 13A03504 **R13**

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

METAL FORMING PROCESSES

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Define strain hardening.
(b) What is yield locus?
(c) Define draft in rolling operation.
(d) Explain the principle of metal shearing.
(e) State any four extrusion process producer defects.
(f) Define drawability
(g) What are trimming of flash and straightening of a forging?
(h) Explain stamping process.
(i) Give the classification of rapid proto typing process.
(j) State the applications of rolling.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Explain three dimensional stress analysis.
(b) Compare the properties of hot working and clod working parts.

OR

3 (a) Explain Tresca yield criterion in metal forming process.
(b) Describe recovery and recrystallization in forming process.

UNIT – II

4 (a) Explain various types of rolling mills.
(b) Derive an expression for rolling load in rolling operation.

OR

5 (a) A piece of lead 25 mm x 25 mm x 150 mm having a yield stress of 7 N/mm^2 is to be pressed between flat dies of size 6.25 mm x 100 mm x 150 mm and $\mu = 0.25$. Determine pressure distribution of the total forging load.
(b) Describe drop forging process.

UNIT – III

6 (a) Explain backward extrusion process.
(b) Compare cold and hot extrusion process.

OR

7 (a) Describe deep drawing process.
(b) In a wire drawing operation initial wire diameter is 5.5 mm and final wire diameter is 5 mm. Die angle is 15°, die land is 3 mm and $\mu = 0.1$. Determine drawing load.

UNIT – IV

8 (a) Explain the principle of shear in sheet metal operation.
(b) Sketch and explain principle and operation of bending.

OR

9 (a) Describe tube drawing process.
(b) A piece of stock 2.35 mm thick is bent to an angle of 120° with an inside radius of 6.25 mm. What is the original length of stock that goes into the bend?

UNIT – V

10 (a) Sketch and describe blow moulding.
(b) Explain compression moulding.

OR

11 (a) Explain the concept of rapid manufacturing process.
(b) State the applications of rapid proto typing process.