3E1634

(Sem.III) (Main/Back) Examination, Jan.-2016

Mechanical Engineering

3ME4 Manufacturing Processes

Time : 3 Hours Total Marks : 80 Min. Passing Marks : 26

Instructions to Candidates : Attempt any five questions selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel, missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

UNIT-I

1. (a) Define the following terms as related to casting : Sprue, Gate, Runner, Riser, Draft allowance, Permeability, Cope, Skeleton pattern. (8)

(b) Compare the solidification time of two optimum risers of same volume, when one has a cylindrical shape (h = d) and other is of the form of a square paralleleopiped (L = 4a).

Where L = Length of parallelopipe

a = side of square (8)

OR

1. Write notes : (a) Die casting . (b) Centrifugal casting

UNIT-II

2 (a) Describe press forging. How does it differ from drop forging? Why heat treatment is necessary for forging? (8)

(b) An aluminum wire having yield strength 300 MPa and diameter 10 mm is to be drawn using a HSS die having draw angle 12 and ultimate tensile strength 1.6 GPa.The coefficient of friction before conditioning was 0.25 and after acid picking, sulling, liming and lubricating using soap solution became 0.05. Calculate the drawing force needed for achieving a 20% reduction in area. (8)

OR

2. (a) With the aid of a sketch, briefly describe the process of spinning. Why is it called a flow turning process? (8)

(b) Estimate the clearance and the maximum shearing force needed to punch a rectangular hole of length 1 cm and breadth 5 nun in an aluminum sheet of thickness 4 mm. Given shear strength of aluminum sheet is 0.2 GI a.(8)

UNIT- III

3. (a) Explain TIG and MIG welding processes. Also differentiate between these two processes. (8)

(b) Discuss types of welding defects. Also explain causes, effects and remedies for these defects.

OR

3. (a) Classify various welding processes. Compare welding with brazing and soldering techniques. (8) .

(b) Discuss laser beam welding with the help of sketch. (8)

UNIT-IV

4. (a) What do you understand by powder metallurgy? Explain how powder is formed by electrolytic, carbonyl and mechanical pulverization processes. (8)

(b) Discuss virtual prototyping process and its applications. (8)

OR

4. Describe the process of blending, compacting and sintering in details. (l6)

UNIT-V

5. (a) Define plastics. Differentiate between thermoplastics and thermo-setting plastics. (8)

(b) Writes notes on laminating process. (8)

(c) Casting defects and remedies (4+4+8)

OR

5. Write notes :

(a) Compression moulding (b) Extrusion moulding (c) Blow moulding (d) Calendaring (16)