24169

B. Tech. 4th Semester (ME) Examination, May–2016

MECHANICAL ENGINEERING

Paper–ME-202-F

Manufacturing Technology–I

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt any* ***five*** *questions in total at least* ***one*** *question from each section.* ***Question No. 1 is compulsory.*** *Each question carry equal marks.*

1. Discuss the following :

(a) Chips types and their characteristics

(b) Principles of location

(c) Investment moulding

(d) Welding defects. 5×4

Section–A

2. (a) Discuss the relation of forces in two dimensional or orthogonal cutting. 10

(b) Discuss the various ways of determining the shear angle in the two dimensional cutting operation. 10

3. (a) A 300 mm diameter bar is turned at 45 rev/min with depth of cut of 2 mm and feed of 0.3 mm/rev. The forces measured at the cutting tool point

are : Cutting force = 1850 N, Feed force = 450 N.

Calculate :

(i) Power Consumption

(ii) Specific cutting energy

(iii) Energy consumed if the total metal removed during the turning operation is $2.5 \times 10^6 mm^3$ 10

(b) Find the drilling power for 50 mm diameter drill having a feed of 0.50 mm/rev. The cutting speed is 0.75 m/s. The material factor for brass is 0.55. Determine also the drilling thrust. 10

Section–B

4. (a) Discuss about the milling fixtures and the design principles for milling fixtures in detail. 10

(b) Discuss open the forging process with emphasis on plain strain forging in detail. 10

5. (a) A pipe of annealed steel, inside diameter of 50 mm and wall thickness of 2.5mm is to be reduced to 48.7 mm × 1.75 mm. Die-angle is 30°, μ=0.1 and draft = 3.12. Compare the pipe drawing force on plug and movable mandrels. 10

(b) Discuss about Comparators and its types with detail discussion of Optical Comparator. 10

Section–C

6. (a) Discuss the principles, main parts and applications of turret and capstan lathe. 10

(b) What are the various types of patter in detail. 10

7. (a) What do you understand by the term Milling ? Discuss the working principle involved and classification of Milling machines. How is a milling machine specified ? 10

(b) Discuss about the construction and working of Cupola furnace. 10

Section–D

8. (a) Discuss the principle and types of Resistance welding stating their advantages and limitations. 10

(b) Discuss the advantages of extrusion over other shaping processes. State the main applications of hot extrusion. 10

9. (a) Describe laser beam welding with its principle, applications and advantages in detail. 10

(b) Discuss the hand tools commonly used in sheet metal work. Also discuss the process of bending a sheet metal. 10