

Exam.Code:1014  
Sub. Code: 35208

2125  
M.E. (Mechanical Engineering)  
First Semester  
Elective – I  
MME-105(b): Manufacturing Science

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, selecting atleast two questions from each Part.

x-x-x

PART A

- Q1. Discuss composition, properties and applications of different types of Cast Iron. 10
- Q2. (a) Discuss the key factors to be considered while selecting an engineering material for a specific product? 5
- (b) Write down various Al based alloys mentioning their key properties and engineering applications. 5
- Q3. (a) Explain the mechanics of chip formation and types of chips. 5
- (b) Draw the Merchant's circle diagram for orthogonal cutting, and derive the merchant's shear angle relationship. 5
- Q4. (a) Define oblique cutting and explain how it differs from orthogonal cutting, highlighting key parameters like the angle between cutting edge and tool travel, and chip flow angle. 5
- (b) Derive the relationship of thrust force and torque during milling operation. 5

PART B

- Q5. Explain solidification process of alloys and derive expression for solidification time of a large casting in an insulating mould stating the various assumptions made while doing the analysis. 10
- Q6. Write down various guidelines for riser design and location? Discuss Caine's method and modulus method of riser design. 4,6
- Q7. (a) Describe various non-destructive techniques to identify weld defects. 5
- (b) Discuss the principle and key parameters governing solid state welding. 5
- Q8. Write short note on the following: (i) Laser beam welding (ii) Plasma welding 5,5

x-x-x