

Reg. No. :

Question Paper Code : 20850

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Third Semester

Industrial Engineering

ME 8351 – MANUFACTURING TECHNOLOGY – I

(Common to : Industrial Engineering and management/ Mechanical Engineering/
Mechanical Engineering (sandwich)/ Mechanical and Automation Engineering

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the role of clay in the moulding sand?
2. How are inclusions formed in castings?
3. Differentiate between forehand and backhand welding.
4. How will you classify the weld defects in gas welding?
5. What is the significance of recrystallization in metal forming?
6. Name any four grain flow characteristics of metal in forging.
7. Write the use of clearance in sheet metal forming.
8. List the types of explosives used in explosive forming.
9. Name any four applications of plunger machines.
10. What do you mean by "glass transition temperature"?

PART B — (5 × 13 = 65 marks)

11. (a) (i) How the blow holes are formed in casting? Discuss how they can be eliminated? (5)
- (ii) Explain the working of a cupola furnace with a neat diagram. (8)
- Or
- (b) (i) With a neat sketch, explain the procedure for making a mould. (6)
- (ii) Explain the various stages in preparing investment castings. (7)
12. (a) (i) Distinguish among gas welding, arc welding and resistance welding with respect to temperature generated, quality of welding obtained, applications and cost. (8)
- (ii) Explain the role of inert gases used in TIG welding. (5)
- Or
- (b) (i) Discuss the following welding equipment used in Oxy-acetylene gas welding. (8)
- (ii) Working of electron beam welding. (5)
13. (a) (i) Illustrate the various types of forging dies. (6)
- (ii) Briefly explain the mechanism of Rolling with a neat sketch. (7)
- Or
- (b) (i) What do you understand by isostatic extraction? Explain the same. (6)
- (ii) Illustrate the working principle of tube drawing process. (7)
14. (a) Explain the following sheet metal operations and mention their applications. (13)
- (i) Blanking
- (ii) Drawing
- (iii) Bending
- (iv) Notching
- Or
- (b) (i) Explain the test methods in the shear metal process. (8)
- (ii) Write short notes on micro forming. (5)
15. (a) Explain the suitable molding process for processing of thermoplastics. (13)
- Or
- (b) What are the methods of bonding thermoplastics? Explain any one of them. (13)

PART C — (1 × 15 = 15 marks)

16. (a) A job of dimension 80mm length, 40mm width and 30 mm height is to be made from steel by casting process. The mould for this job is made using a wooden pattern. Determine the dimensions of the wooden pattern assuming machining allowance of 3mm on each side, shaking allowance of 1 mm on length and width and shrinkage allowance of 3%. Draw the required mold box. (15)

Or

- (b) A shell has a height of 48 mm and a diameter of 48 mm the corner radius is 2mm and workpiece materials is medium carbon steel and is 1 mm thick. Design a die for drawing operation when σ_y for medium carbon steel is 3600 kg/cm². (15)