Reg. No. | | | | | | | | | | | | |

**Question Paper Code : 80654**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Mechanical Engineering (Sandwich)

ME 6302 — MANUFACTURING TECHNOLOGY – I

(Common to Third Semester Industrial Engineering, Industrial Engineering and Management, Mechanical and Automation Engineering and Mechanical Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the characteristics of a core?
2. Name the alloys which are generally die cast. Why are aluminium alloys preferably cast in cold chamber die casting machines?
3. Why do residual stresses get developed in weldments?
4. Why the temperature in plasma arc welding is much higher than in other arc welding processes?
5. Why is it necessary to condition the metal before hot rolling?
6. Give a few examples of hot forged products.
7. What are the desirable qualities in metal for maximum stretchability?
8. What are the applications of rubber pad forming process?
9. Name the various methods of processing thermoplastics.
10. Define film blowing.

PART B — (5 × 13 = 65 marks)

11. (a) (i) How are patterns classified? Describe any two types with sketches and state the uses of each of them. (7)

(ii) Enumerate the casting defects and suggest suitable remedies. (6)

Or

(b) (i) Explain the process of centrifugal casting with suitable sketch and state its specific applications. (8)

(ii) What are the main characteristics of a mould sand? (5)

12. (a) (i) Compare MIG and TIG welding in respect of their principle of working and field of application. (8)

(ii) What is a soldering flux? What different types of soldering fluxes are used? (5)

Or

(b) Write short notes on (i) Electron beam welding (ii) Friction stir welding. (6+7)

13. (a) (i) Briefly explain the various operations performed in forging process. (7)

(ii) With suitable sketches, explain the stages involved in Shape rolling of structural sections. (6)

Or

(b) (i) Explain the working of Mannesmann process with neat sketch. (7)

(ii) How is tube drawing carried out? Explain with suitable sketch. (6)

14. (a) (i) Explain the various sheet metal forming operations with neat sketches. (8)

(ii) Discuss with neat sketch, the working of metal spinning process. (5)

Or

(b) With neat sketches explain the following (i) Hydro forming and (ii) Super plastic forming. (6+7)

15. (a) Describe the following plastic processing methods with neat sketches (i) Compression moulding (ii) Blow moulding. (7+6)

Or

(b) (i) Why is the thermoforming a valuable method for the plastic manufacturer? Explain the process with neat sketch. (7)

(ii) State the purpose of the following in plastics (1) Plasticizers (2) Fillers and (3) Stabilizer. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Derive the mathematical expression for the Flat strip metal rolling process to calculate the rolling load. (15)

Or

(b) A casting is required to have the following composition: C-3.25%, Si-1.8%, Mn-0.6%, P-0.5% and S-0.1%. Determine the weight of pig iron from pile A and pile B to be picked up in each metal charge if the charge (200 kg) is to contain pig iron –50%, foundry return –40% and purchased scrap –10%. Analysis of these metals is as follows: (15)

| Metal | Si% | Mn% | S% | P% |
|---|---|---|---|---|
| Pig iron (pile A) | 2.4 | 0.9 | 0.05 | 0.4 |
| Pig iron (pile B) | 1.4 | 0.95 | 0.05 | 0.35 |
| Foundry returns | 1.7 | 0.6 | 0.06 | 0.3 |
| Purchased scrap | 2.2 | 0.7 | 0.07 | 0.25 |