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Question Paper Code : 57542

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Third Semester

Mechanical Engineering

ME 6302 – MANUFACTURING TECHNOLOGY – I

(Common to Industrial Engineering, Industrial Engineering and Management and Mechanical and Automation Engineering and also common to Fifth Semester Mechanical Engineering Sandwich)

(Regulation 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What are the causes of “misruns” in castings ?
2. What are chaplets ?
3. Why is spot welding commonly used in automotive bodies and in large appliances ?
4. What is the role of flux in welding operation ?
5. Why is the surface finish of a rolled product better in cold rolling than in hot rolling ?
6. What is strain rate sensitivity ?
7. Estimate the force required for punching a 25 mm diameter hole through a 3.2 mm thick annealed titanium alloy Ti-6Al-4V sheet at room temperature. The UTS for this alloy can be assumed to be 1000 MPa.
8. Name any two superplastic materials.

9. Viscosity is an important property of a polymer melt in plastics shaping processes. Upon what parameters does viscosity depend ?
10. What is the difference between a positive mould and a negative mould in thermoforming ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Why are steels more difficult to cast than cast irons ? (6)
- (ii) What are the operations required in sand casting after the casting is removed from the mould ? Write briefly about any two of them. (10)

OR

- (b) (i) What is the drawback of hot-chamber die casting with respect to casting of different metals ? (4)
- (ii) With neat diagrams explain the process of cold-chamber die casting operation. (12)
12. (a) (i) What are the advantages and disadvantages of welding compared to other types of assembly operations ? (12)
- (ii) What is the principle of resistance welding processes ? (4)

OR

- (b) Explain gas metal arc welding process with a neat diagram.
13. (a) With neat diagram explain the process of forward extrusion. Explain also how hollow sections can be produced in this process.

OR

- (b) A 300 mm wide strip 25 mm thick is fed through a rolling mill with two powered rolls each of radius = 250 mm. The work thickness is to be reduced to 22 mm in one pass at a roll speed of 50 rev/min. The work material has a flow curve defined by $K = 275 \text{ MPa}$ and $n = 0.15$ and the coefficient of friction between the rolls and the work is assumed to be 0.12. Determine if the friction is sufficient to permit the rolling operation to be accomplished. If so, calculate the roll force, torque and horsepower.

14. (a) Write short notes on the following :

(i) Shearing (4)

(ii) Blanking (4)

(iii) Clearance in shearing (4)

(iv) Springback in bending (4)

OR

(b) With neat diagrams explain the process of Rubber pad forming and Hydroforming.

15. (a) (i) Briefly describe the injection moulding process. (10)

(ii) Discuss any two of the defects that can occur in plastic injection moulding. (6)

OR

(b) Explain the process of compression moulding with neat diagrams.
