

**MODERN MANUFACTURING TECHNOLOGY  
(MECH 4283)**

**Time Allotted : 3 hrs**

**Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group – A  
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Dry sand core is used in green sand moulding for making,  
(a) sound casting (b) hollow casting  
(c) thin casting (d) thick casting.
  - (ii) Hot working is done,  
(a) just above ambient temperature  
(b) below recrystallisation temperature  
(c) above recrystallisation temperature  
(d) just below melting point.
  - (iii) Brass is an alloy of  
(a) Cu. And Al (b) Cu and Zn  
(c) Cu and Sn (d) Cu and Pb
  - (iv) Blanks made of sheet metal are manufacture by,  
(a) forging (b) rolling (c) press work (d) machining
  - (v) What is the full name of SLS?  
(a) Selective Laser Simulator (b) Sintering Laser Simulator  
(c) Selective Laser Sintering (d) Stereolithography Laser Sintering
  - (vi) The Electrical Discharge machining (EDM) process is  
(a) Burr free (b) Not for hard metals  
(c) Direct contact machining (d) Capable of producing sharp corners
  - (vii) Mechanism of material removal in Electron Beam Machining is due to  
(a) Mechanical erosion due to impact of high of energy electrons  
(b) Chemical etching by the high energy electron  
(c) Sputtering due to high energy electrons  
(d) Melting and vaporisation due to thermal effect of impingement of high energy electron.

- (viii) Dimensional accuracy in powder metallurgy is  
(a) High (b) Medium  
(c) Low (d) None of the mentioned
- (ix) Extrusion is generally used for  
(a) Thermosetting materials (b) Thermoplastic materials  
(c) Elastomers (d) Phenol-formaldehyde.
- (x) Which plastic materials contain strong cross linkings in their molecular structure?  
(a) Thermoplastic materials (b) Thermosetting materials  
(c) Both (a) and (b) (d) None of the above.

**Group – B**

2. (a) Explain how machining differs from forming. Discuss on forward and backward extrusion process.  
(b) Define hardness, toughness, creep.  
 $(2 + 4) + (3 \times 2) = 12$
3. (a) Discuss on gas welding and arc welding process.  
(b) Differentiate between Hot working and Cold working of metals. Discuss on the Drop forging process.  
 $6 + (2 + 2 + 2) = 12$

**Group – C**

4. (a) Describe the different components of a Computer integrated Manufacturing system. How these are integrated?  
(b) With the help of a schematic diagram describe a Flexible Manufacturing Cell.  
 $(5 + 2) + 5 = 12$
5. (a) Enumerate Group Technology and part classification and coding system.  
(b) Explain any one method of rapid prototyping with neat sketch.  
 $7 + 5 = 12$

**Group – D**

6. (a) What are the various types of energy sources used in non-traditional machining techniques? Give examples for each. Explain why we use non-traditional machining processes?  
(b) With a suitable diagram, explain the working principle of Electron Beam Machining (EBM) process.  
 $(2 + 2 + 2) + 6 = 12$

7. (a) Draw the basic electrical waveform and briefly describe spark initiation and material removal mechanism in Electric-discharge Machining (EDM) process. What is duty cycle?
- (b) What are the advantages and Disadvantages of EDM?

**(6 + 2) + 4 = 12**

**Group – E**

8. (a) Describe Pressure thermoforming molding process with a schematic diagram.
- (b) What types of finishing operations are used on ceramics?

**8 + 4 = 12**

9. (a) What is thermoplastic? Write down some examples of thermoplastics.
- (b) With a neat sketch explain the slip casting process for making ceramic vessel.

**(2 + 2) + 8 = 12**

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