

# 3E1634

## B.Tech. (Sem.III) (Main/Back) Examination, 2015 Mechanical Engineering 3ME4 Manufacturing Processes

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Time : 3 Hours

Total Marks : 80  
Min. Passing Marks : 26

### Instructions to Candidates :

Attempt any five questions selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

#### UNIT-I

1. (a) Elaborate casting process. Why is it preferred over other methods of production? List the common defects found in casting. (8)
  - (b) What do you mean by solidification and establish the relationship between solidification time, volume and surface area of casting. (8)
- Two solid castings, one sphere with radius 'R' and another cylinder with diameter (d) equal to its height (h) and both having same volume are to be sand cast. Find out which of the two will solidify faster. (8)

OR

1. Write short notes on (any four) : (16)
- |                                 |                     |                   |
|---------------------------------|---------------------|-------------------|
| (a) Basic steps in sand casting | (b) Sand properties | (c) Gating system |
| (d) Pattern allowances          | (e) Slush casting   |                   |

#### UNIT-II

2. (a) Differentiate cold working and hot working. Explain the principle of rolling. (8)
- (b) What are the various sheet metal operations? Also discuss various metal working defects. (8)

OR

2. Explain the process of extrusion given below. Indicate one typical product made through each of these processes: (16)
- |                           |                        |
|---------------------------|------------------------|
| (a) Direct Extrusion      | (b) Indirect Extrusion |
| (c) Hydrostatic Extrusion | (d) Impact Extrusion   |

#### UNIT-III

3. (a) Define welding. Explain welding positions and welding techniques. Compare welding with riveting and casting. (8)
- (b) With the help of sketch explain laser beam welding. Write advantages and limitations of laser beam welding. (8)

OR

3. (a) Classify various welding processes. With sketch explain the different types of oxy-acetylene flames formed in gas welding. (8)
  - (b) Write short notes on following : (8)
- |                         |                             |
|-------------------------|-----------------------------|
| (i) TIG and MIG welding | (ii) Brazing and soldering. |
|-------------------------|-----------------------------|

#### UNIT-IV

4. What do you mean by powder metallurgy? How will you compare powder metallurgy with other manufacturing process? Discuss various stages of this process. Enlist applications of powder metallurgy. (16)

OR

4. (a) Write the purpose of mixing of powder and lubricants in powder metallurgy. Write advantages and limitations of powder metallurgy. (8)
- (b) State rapid prototyping processes with their tooling techniques. Explain subtractive and additive processes. (8)

#### UNIT-V

5. (a) Describe major production methods that are used in plastic industry. (10)
- (b) Differentiate thermo-setting plastics and thermo plastics. (6)

OR

5. Write short notes on following: (16)
- |                          |                       |
|--------------------------|-----------------------|
| (a) Injection moulding   | (b) Transfer moulding |
| (c) Compression moulding | (d) Laminating        |

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