Code No: **R164103E** **R16** **Set No. 1**

**IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021**

# DESIGN FOR MANUFACTURE

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks: 70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***

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## PART–A *(14 Marks)*

1. a) What is manufacturability? [3]
   b) What is surface roughness? [2]
   c) What is the effect of porosity in design for casting? [2]
   d) What are the good design practices for joining? [3]
   e) What is the difference between drawing and deep drawing operation? [2]
   f) Give the applications of injection moulding process. [2]

## PART–B *(4x14 = 56 Marks)*

2. a) Discuss briefly the basic principles of designing for economical production. [7]
   b) Explain total product life cycle. [7]

3. a) Discuss dimensional tolerances and surface finish? Give examples of poor and good designs for machining. [7]
   b) Explain the concept of redesign of components for machining ease. [7]

4. a) What is the importance of solidification in casting process? Explain. [7]
   b) Discuss product design rules for sand casting. [7]

5. a) Discuss the general design recommendations for forging operation. [7]
   b) Why pre and post treatment of welds are done? Explain. [7]

6. a) Explain design considerations affecting drawability. [7]
   b) Illustrate the Keeler Goodman forging line diagram. [7]

7. a) Explain the design guide lines for plastic components. [7]
   b) Discuss about the visco elastic and creep behavior in plastics. [7]

Code No: **R164103E** **R16** **Set No. 2**

**IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021**

**DESIGN FOR MANUFACTURE**

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks: 70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***
*****

## PART–A *(14 Marks)*

| | | | | |
|---|---|---|---|---|
| 1. | a) | Briefly explain importance of product design. | [3] |
| | b) | List out general design rules for machining. | [2] |
| | c) | Explain the behavior of cast iron during solidification. | [3] |
| | d) | Write effect of residual stresses in weld joints. | [2] |
| | e) | Explain the design principles for bending operation. | [2] |
| | f) | Write any four design guidelines for injection moulding? | [2] |

## PART–B *(4x14 = 56 Marks)*

| | | | |
|---|---|---|---|
| 2. | a) | What do you understand from design philosophy? Explain in detail. | [7] |
| | b) | List out and explain the general design rules for manufacturability. | [7] |
| 3. | a) | Explain how, the design rules for machining are intended to improve the part quality and reduce machining costs? | [7] |
| | b) | Discuss factors for machining of rotational components. | [7] |
| 4. | a) | Discuss the general design considerations for casting process. | [7] |
| | b) | Discuss selection of casting processes for various materials. | [7] |
| 5. | a) | Briefly explain the design guidelines for brazed joints. | [7] |
| | b) | Sketch and explain the design of parting line of dies. | [7] |
| 6. | a) | Explain the design guidelines for extruded sections. | [7] |
| | b) | Discuss the design principles for bending. | [7] |
| 7. | a) | Explain the design guidelines for machining of plastics. | [7] |
| | b) | Explain the Visco elastic behaviour in plastics. | [7] |

Code No: **R164103E** **R16** **Set No. 3**

**IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021**

# DESIGN FOR MANUFACTURE

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks: 70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***
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## PART–A *(14 Marks)*

| | | | |
|---|---|---|---|
| 1. | a) | Discuss creative methods for design. | [3] |
| | b) | What is machinability? | [2] |
| | c) | What is the effect of blow hole in design for casting? | [2] |
| | d) | What is forging operation? | [2] |
| | e) | What is deep drawing? Why is it used? | [3] |
| | f) | Write any four design guidelines for machining for plastics? | [2] |

## PART–B *(4x14 = 56 Marks)*

| | | | |
|---|---|---|---|
| 2. | a) | Explain the selection of materials for economical production. | [7] |
| | b) | Explain the general design rules for manufacturability. | [7] |
| 3. | a) | What are the general problems we come across while designing for machining operations? Explain how one can overcome those problems | [7] |
| | b) | Discuss the economic design considerations in machining. | [7] |
| 4. | a) | Discuss on casting tolerances in metal casting. | [7] |
| | b) | How to select a right metal casting process? Explain. | [7] |
| 5. | a) | Explain briefly the design rules for welding. | [7] |
| | b) | List out and explain the factors which affect the design of weldments. | [7] |
| 6. | a) | Explain design guidelines for extruded sections. | [7] |
| | b) | Discuss the design considerations for punching and blanking operations. | [7] |
| 7. | a) | Explain the design guidelines for joining of plastics. | [7] |
| | b) | Explain the creep behaviour in plastics. | [7] |

Code No: **R164103E** **R16** **Set No. 4**

**IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021**

**DESIGN FOR MANUFACTURE**

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks: 70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***
*****

## PART–A *(14 Marks)*

| | | | | |
|---|---|---|---|---|
| 1. | a) | Explain design philosophy in product design. | [3] |
| | b) | Explain factors for machining - ease. | [2] |
| | c) | What do you understand from section size effect in casting? Explain. | [2] |
| | d) | Explain the forging design considerations for a closed die. | [3] |
| | e) | Differentiate between punching and blanking. | [2] |
| | f) | What is plastic? List out the types of plastics. | [2] |

## PART–B *(4x14 = 56 Marks)*

| | | | |
|---|---|---|---|
| 2. | a) | Discuss the processing steps of a design process. | [7] |
| | b) | Explain how creativity can influence design with a suitable example. | [7] |
| 3. | a) | Explain the special machining considerations for hole making operation. | [7] |
| | b) | What are the design recommendations that you can suggest for machining non-rotational parts? | [7] |
| 4. | a) | Explain solidification mechanism in sand casting. | [7] |
| | b) | Compare shop floor and simulation methods for casting. | [7] |
| 5. | a) | Bring out various applications of closed die forging. | [7] |
| | b) | Explain the effect of thermal stress in weld joints. | [7] |
| 6. | a) | Briefly discuss about design for blanking. | [7] |
| | b) | Discuss the design guide lines for deep drawing. | [7] |
| 7. | a) | Explain the design considerations for injection moulding. | [7] |
| | b) | Discuss the general design guide lines for plastic components. | [7] |