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Reg No.:_____ Name:_____



**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S8 (R,S) Examinations April 2026 (2019 Scheme)

# Course Code: RAT416
## Course Name: DESIGN FOR MANUFACTURING AND ASSEMBLY

**Max. Marks: 100** **Duration: 3 Hours**

### PART A
*Answer all questions, each carries 3 marks.*

| | | Marks |
|---|---|---|
| 1 | What do you mean by design philosophy? | (3) |
| 2 | List the design rules for manufacturability. | (3) |
| 3 | Compare planing and shaping | (3) |
| 4 | What are the applications of Ultrasonic machining? | (3) |
| 5 | What are the benefits of using solidification simulation? | (3) |
| 6 | List the challenges of casting simulation. | (3) |
| 7 | Differentiate between direct and indirect extrusion. | (3) |
| 8 | Write about the advantages of cold extrusion over hot extrusion. | (3) |
| 9 | Explain the significance of Design for Assembly (DFA). | (3) |
| 10 | How do general design guidelines for manual assembly contribute to DFA methodology? | (3) |

### PART B
*Answer any one full question from each module, each carries 14 marks.*

**Module I**

| | | | |
|---|---|---|---|
| 11 | a) | Write a short note on creativity in design. | (7) |
| | b) | How are materials selected for a design? | (7) |

**OR**

| | | | |
|---|---|---|---|
| 12 | a) | Elaborate the developments in material technology. | (6) |
| | b) | Explain material selection interrelationship with process selection. | (8) |

**Module II**

| | | | |
|---|---|---|---|
| 13 | a) | Explain EDM with the help of neat sketch. | (8) |
| | b) | Discuss the general design rules for machining | (6) |

**OR**

| | | | |
|---|---|---|---|
| 14 | a) | Evaluate the redesigning for machining ease. | (6) |
| | b) | What are the general design recommendations for machined parts. | (8) |

## Module III

15 a) Write a short note on investment casting (8)

b) Briefly explain the design of brazed joints. (6)

**OR**

16 a) With a neat sketch explain oxy acetylene welding. (8)

b) Mention the product design rules for sand casting (6)

## Module IV

17 a) Explain the design guidelines of sheet metal bending. (7)

b) Write a short note on design guidelines for extruded sections (7)

**OR**

18 a) With a neat diagram explain forging die setup. (6)

b) What is the purpose of heat treatment in forging? (8)

## Module V

19 a) Illustrate how part symmetry, thickness, size, and weight influence assembly efficiency with examples. (8)

b) Discuss the challenges associated with estimating insertion time in assembly processes (6)

**OR**

20 a) Describe the significance of classification systems for manual handling, insertion, and fastening in assembly operations. Discuss how these systems contribute to improving efficiency and reducing errors in manufacturing processes (14)

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