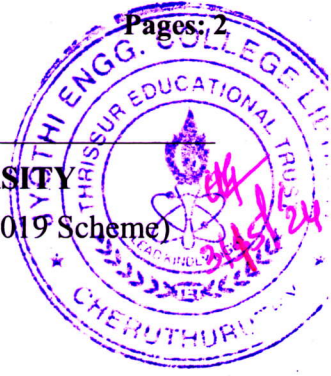


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Eighth Semester B.Tech Degree (R,S) Examination May 2024 (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 | Draw the flow chart showing the various phases of design process. | (3) |
| 2 | What are the criteria for material selection? | (3) |
| 3 | Compare traditional and non traditional machining process. | (3) |
| 4 | Explain a) milling b) turning c) grinding | (3) |
| 5 | Briefly explain the steps in casting. | (3) |
| 6 | List the benefits of casting simulation | (3) |
| 7 | Distinguish between open and closed die forging. | (3) |
| 8 | List the design guidelines for sheet metal bending. | (3) |
| 9 | Explain the role of robots in handling and assembly | (3) |
| 10 | Discuss the types of manual assembly methods | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- | | | |
|----|---|-----|
| 11 | a) Explain the general design rules for manufacturability. | (7) |
| | b) Mention the basic principles of designing for economical production. | (7) |

OR

- | | | |
|----|--|-----|
| 12 | a) Elaborate the methods of material selection. | (8) |
| | b) List the advantages of applying DFMA during product design. | (6) |

Module II

- | | | |
|----|--|-----|
| 13 | a) With a neat sketch, explain the construction and working of AWJM. | (8) |
| | b) With the help of an example explain the steps in selecting manufacturing process. | (6) |

OR

- | | | |
|----|--|-----|
| 14 | a) Explain Abrasive Jet Machining. | (8) |
| | b) Write a short note on designing for machining ease. | (6) |

Module III

- 15 a) Describe the important pre- heating and post heating guidelines for a good welding design (7)
b) Explain sand casting process with suitable diagram. (7)

OR

- 16 a) Explain the effects of thermal stresses in weld design. (7)
b) Write about the various metal joining processes. (7)

Module IV

- 17 a) What are the various passes in drop forging? (8)
b) Discuss the purpose of heat treatment on forging. (6)

OR

- 18 a) Mention the component design for blanking. (8)
b) Explain formability limit diagram. (6)

Module V

- 19 a) Explain the effect of chamfer design on manual insertion (6)
b) Discuss the effect of the following part features: (8)
i) Effect of part symmetry on handling time
ii) Effect of weight on handling time

OR

- 20 a) Explain the design guidelines for component insertion and mechanical fastening. (7)
b) List the assembly rules and criteria. Discuss the major benefits of design for assembly (7)
