

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Second Semester

ME - CAD/ CAM

24PCDPC201 - DESIGN FOR MANUFACTURE, ASSEMBLY AND ENVIRONMENTS

Regulations - 2024

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. In Design for Manufacturability, why should excessive strength is avoided in component design? (a) It increases corrosion resistance (b) It may lead to unnecessary material usage and higher cost (c) It reduces assembly time (d) It improves surface finish	1	K1	CO1
2. Which evaluation method in DFM helps in comparing alternative designs based on cost, quality, and ease of manufacture? (a) Failure Mode and Effects Analysis (FMEA) (b) Value engineering (c) Finite element analysis (d) Heat treatment analysis	1	K1	CO1
3. Which manufacturing process allows maximum flexibility in achieving complex internal shapes? (a) Forging (b) Welding (c) Casting (d) Rolling	1	K1	CO2
4. When designing welded structures, the choice of material should emphasize: (a) High hardness only (b) Good weldability and compatible thermal properties (c) Maximum density (d) High melting point alone	1	K1	CO2
5. Which design feature most effectively facilitates drilling operations? (a) Blind holes with sharp corners (b) Deep holes with varying diameters (c) Standard hole sizes with adequate clearance (d) Irregular hole orientation	1	K1	CO3
6. Simplification by separation in product design means: (a) Combining multiple functions into one part (b) Dividing a complex part into simpler components (c) Eliminating fasteners (d) Increasing assembly steps	1	K1	CO3
7. While redesigning a casting, the parting line should preferably be located to: (a) Increase surface roughness (b) Minimize mold complexity and casting defects (c) Increase number of cores (d) Improve aesthetic appearance	1	K1	CO4
8. An uneconomical casting design is best identified by: (a) Simple external geometry (b) Excessive use of cores and machining operations (c) Uniform wall thickness (d) Standardized features	1	K1	CO4
9. The primary objective of Design for Environment (DFE) is to: (a) Maximize product aesthetics (b) Minimize environmental impact throughout the product life cycle (c) Reduce only manufacturing cost (d) Increase product complexity	1	K1	CO5

10. Design for disassembly and recyclability primarily aims to: 1 K1 CO5
- (a) Increase product weight
- (b) Simplify end-of-life processing and material recovery
- (c) Improve product appearance
- (d) Increase manufacturing complexity

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. What is meant by evaluation of concept? 2 K1 CO1
12. Summarize factors involved for Mechanisms selection. 2 K2 CO1
13. Draw the block diagram of form design. 2 K2 CO2
14. Summarize the design rules for welding. 2 K2 CO2
15. Explain about functional datum. 2 K2 CO3
16. Compare the difference between clamp ability and accessibility. 2 K2 CO3
17. Define group technology. 2 K1 CO4
18. Explain modified design. 2 K2 CO4
19. Summarize the guideline for material selection. 2 K2 CO5
20. Define disassembly. 2 K1 CO5
21. What are the guidelines for product structure? 2 K1 CO5
22. List the Steps involved in Material choice. 2 K2 CO2

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23. a) Summarize the design principles which used in manufacturability. 11 K2 CO1
- OR**
- b) Discuss in detail the geometric tolerances with examples. 11 K2 CO1
24. a) With a suitable sketch explain in detail about the form design of welded defects. 11 K2 CO2
- OR**
- b) Explain the constraints of welding in terms of manufacturability with an example. 11 K2 CO2
25. a) Discuss in detail about the reduction of machined area by simplification by separation with suitable sketch. 11 K2 CO3
- OR**
- b) Explain in detail about simplification by amalgamation. 11 K2 CO3
26. a) Explain in detail about machined holes in casting process. 11 K2 CO4
- OR**
- b) With suitable sketch explain in detail about design features to facilitate machining drills and milling cutters. 11 K2 CO4
27. a) Summarize in detail about the weighted sum assessment method. 11 K2 CO5
- OR**
- b) List and explain the design factors to be consider for environmental impact. 11 K2 CO5
28. a) Explain in detail with suitable sketch of optiz method. 11 K2 CO4
- OR**
- b) Illustrate the constraints of forgings in terms of manufacturability with an example. 11 K2 CO3