Reg. No. : | E | N | G | G | T | R | E | E | . | C | O | M |

Question Paper Code : 50738

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fifth/Sixth Semester

Mechanical Engineering

CME 340 – CAD/CAM

(Common to : Industrial Engineering/Industrial Engineering and Management/Mechanical and Automation Engineering)

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How do special characteristics impact the design process and product functionality?

2. What is the significance of revising drawings in managing Engineering Change Notices (ECN)?

3. Why title block in 2D drafting is important?

4. What is ballooning in 2D drafting, and how is it utilized for inspection reporting?

5. What does BIW (Body In White) mean in the context of 3D modeling?

6. What is the difference between parametric and non-parametric modeling in 3D design?

7. What are the advantages of using assembly modeling in the design process?

8. Define clearances, undercuts and interferences in the context of assembly modeling.

9. What are the difference between, 3, 4 and 5–axis machines?

10. Why is machining program simulation crucial in the CNC machining process?

PART B — (5 × 13 = 65 marks)

11. (a) Explain how a through understanding of the basics of design contributes to the overall success of engineering projects.

Or

(b) Discuss the role of GD&T in improving manufacturing processes and product quality.

12. (a) Explain with an example, the purpose of broken section views and offset section views in engineering drawings.

Or

(b) Evaluate the features of 2D drafting software that facilitate efficient inspection reporting and quality control.

13. (a) Evaluate the advantages and limitations of surface modeling compared to solid modeling in various engineering applications.

Or

(b) Elucidate the importance of Boolean operations in creating complex shapes and assemblies in 3D modeling, and discuss real-world examples where they are applied.

14. (a) Elucidate the methods used for assessing the manufacturability and functionality of assemblies through modeling.

Or

(b) Explain the cumulative effect of tolerances in after-assembly conditions and its impact on product performance.

15. (a) Explain the key elements of CAM programming, such as orientation, boundary creation, cutter path selection, and cutter compensation.

Or

(b) Discuss the methods used for tool path generation in CNC machining, including strategies for both drilling and milling operations.

50738

PART C — (1 × 15 = 15 marks)

16. (a) Analyze the role of parametric modeling in facilitating design changes and iterations compared to non-parametric modeling.

Or

(b) How would you approach the integration of a new CNC machining program with existing machine tools in a manufacturing facility? Consider factors such as compatibility, machine capabilities, software requirements, operator training, and ensuring minimal disruption to production schedules. Provide a detailed plan outlining the steps you would take to successfully implement this integration while maximizing efficiency and minimizing downtime.