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Question Paper Code : 80921

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

Sixth/Seventh Semester

Mechanical Engineering

ME 8691 – COMPUTER AIDED DESIGN AND MANUFACTURING

(Common to : Mechatronics Engineering)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define CAD.
2. What is the function of a coordinate system in computer graphics?
3. Write the limitations of Hermite curves.
4. How are B–spline surfaces used in geometric modeling?
5. What is OpenGL?
6. Enumerate the benefits of using standardized CAD data exchange formats.
7. Differentiate NC Systems and CNC systems.
8. How do G codes and M codes differ in CNC part programming?
9. Define Group Technology (GT)
10. What is the role of the Optiz Part Coding System in manufacturing?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the concepts of CAM and their importance in the manufacturing process. Also write briefly about mathematical models for assessing production performance.

Or

(b) Explain 2D and 3D transformations in computer graphics with an example.

12. (a) (i) Discuss the importance of surface continuity in geometric modeling. (7)

(ii) Explain the different levels of surface continuity. (6)

Or

(b) Elucidate the concepts of CSG and B–rep in geometric modeling.

13. (a) Explain the purpose of Graphical Kernel System (GKS) in computer graphics standards. How does it help in developing CAD applications?

Or

(b) Explicate the data exchange standards, IGES and STEP. What are the advantages and disadvantages of each standard?

14. (a) Explain the different types of CNC controllers, including open loop and closed–loop systems, with illustrations.

Or

(b) With an example, write a CNC program to perform a lathe operation.

15. (a) Explain the process of Production Flow Analysis. How does it help to improve manufacturing operations?

Or

(b) What is Flexible Manufacturing System (FMS)? What are its main components? Explain its benefits in manufacturing.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Explain the importance of CAD standards for data exchange and communication in a multi–vendor CAD environment. What are some of the challenges involved in implementing and adhering to such standards, and how can they be addressed?

Or

(b) Explain the process of manual part programming on Milling machine using G and M codes. Discuss the different types of codes, cutting cycles, loops, sub–programs, and macros used in programming.

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