Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 60562

M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

First Semester

CAD / CAM

ED 4153 – COMPUTER APPLICATIONS IN DESIGN

(Common to : M.E. Computer Aided Design / M.E. Computer Integrated Manufacturing / M.E. Engineering Design / M.E. Product Design and Development)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write short notes on scan conversion.

2. List out the factors that need to be considered in purchasing of a CAD system.

3. How does CAD help reduce the product development time?

4. What are the functions of a Graphics card in a work station?

5. A circle has its center at its point (4,5) and radius? How will you parametrically represent the circle?

6. Sketch the shapes of a Bezier curve and a B-spline curve given the control points (0,0), (3,1), (3,4) and (50).

7. Differentiate between sweep modeling and boundary representation.

8. What are the different networking technologies used in a Design Office to network design workstations?

9. List the various stages of activities involved in product development.

10. What are the different mass properties that can be obtained from a CAD model?

PART B — (5 × 13 = 65 marks)

11. (a) A line is to be drawn from (0,0) to (10,7). Determine the intermediate pixels using Bresenham's method.

Or

(b) Explain the Digital Differential Analyzer line drawing algorithms. Using DDA algorithm sketch the pixels for the line drawn from (5,5) to (15,5).

12. (a) What is meant by Class A surfaces? Why it is preferred in panel design of automobiles? Explain in detail.

Or

(b) Discuss the features of STEP used for transport of graphics data across different modelling packages. What are its advantages over other formats?

13. (a) The coordinates of tour control points for drawing a curve are P_0 (100,200), P_1 (150, 350), P_2 (300, 300) and P_3 (350, 150). Sketch the difference between a Bezier curve and B spline generated by these control points.

Or

(b) Compare Hermite, Bezier and B-Spline representation of curves. Mention which curve characteristics are represented by the control points, the continuity of these representations and the advantages and disadvantages of each representation.

14. (a) What are the various methods used for removal of hidden surfaces? Explain any one algorithm in detail.

Or

(b) Explain in detail how does the Phong model differ from Gauraud shading model.

15. (a) With a neat sketch, illustrate the product life cycle of a Vertical Machining Center.

Or

(b) Explain the materials selection process with a suitable example, choosing a product from light weight aircraft applications.

PART C — (1 × 15 = 15 marks)

16. (a) A three-dimensional component in shown in Figure 1. Discuss elaborately the steps involved in modelling the component.

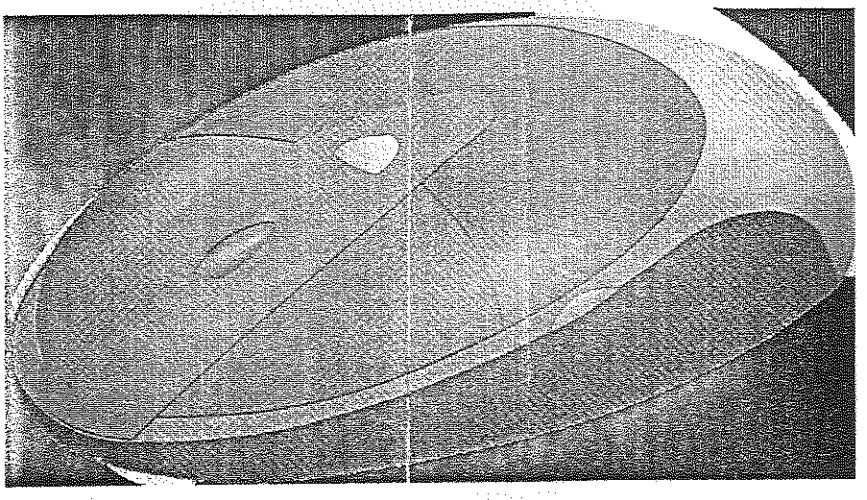

Figure 1 : Wireless Mouse

Or

(b) Discuss in detail the step-by-step procedure to model in tail stock body of a centre lathe.