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

Question Paper Code : 70828

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth/Seventh/Tenth Semester

Mechanical Engineering

ME 6501 – COMPUTER AIDED DESIGN

Common to : Mechanical Engineering (Sandwich)/Manufacturing Engg./Mechatronics Engineering

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What is homogeneous coordinate?

2. What do you mean by synthesis of design?

3. Write the equation of a circle in parametric form.

4. Mention the various limitations of using wire frame models.

5. What are the improvements brought by Gouraud shading compared with other shading techniques?

6. Mention the importance of coloring of three dimensional objects in computer graphics.

7. What is Top-down assembly modeling?

8. List the advantages of Tolerance Analysis.

9. Compare the shape based and the product data based exchange standards.

10. What is meant by CAD data exchange? Mention its importance.

PART B — ($5 \times 13 = 65$ marks)

11. (a) (i) Describe various stages of design process with an example. (7)

(ii) Explain a line drawing algorithm. (6)

Or

(b) (i) Define Clipping. Also explain the working of a simple line clipping algorithm. (7)

(ii) Deduce windowing and viewing transformation matrix Parametrically. (6)

12. (a) Explain different types of Geometric modeling with suitable examples. (13)

Or

(b) Explain the various curve generation techniques with suitable examples. (13)

13. (a) Explain the different types of hidden line algorithms.

Or

(b) Briefly explain the user driven, procedural and data-driven animation techniques.

14. (a) Briefly explain the elements of a mechanism analysis.

Or

(b) Write short note on : Statistical tolerance analysis.

15. (a) State the need and requirements of the product data exchange between dissimilar CAD/CAM systems. Describe the STEP methodology. (13)

Or

(b) Explain the following:

(i) Graphical Kernel System. (6)

(ii) CALS (7)

PART C — (1 × 15 = 15 marks)

16. (a) Generating and displaying contour images in engineering applications (ex: stress contours in finite element analysis) provide designers with valuable information for sound design decisions. Propose a method and algorithm to develop these contours and their images. (15)

Or

(b) (i) Describe bottom up and top down assembly design with an example for each. (8)

(ii) What do you mean by tolerance analysis? List different methods and explain one of the methods in detail. (7)

———————