W 2527

M.E. DEGREE EXAMINATION, JANUARY 2007.

First Semester

CAD/CAM

CC 1601 — COMPUTER APPLICATIONS IN DESIGN

(Common to M.E. Engineering Design)

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give the DDA Algorithm for drawing the straight line.
2. Derive the transformation matrix to rotate a point about the origin.
3. What are the various types of surfaces?
4. Show the Euler-pontcare formula for checking the validity of solid model.
5. What are the differences between Tolerance Analysis and Tolerance synthesis?
6. What are the Neutral File Translators?
7. What are the advantages of homogeneous coordinate systems?
8. Give a typical data structure used in storing solid models.
9. What is Hidden line Elimination?
10. What is Rapid prototyping?

PART B — (5 × 16 = 80 marks)

11. (a) Find the transformed position vectors of a polygon A(10, 10), B(50, 10) C(70, 50) D(30, 50) using a single transformation matrix that does the following operations :

(i) Rotation about the origin by + 90°

(ii) Translation in x axis by 10 units

(iii) Reflection about the y = 0 line. (16)

Or

(b) Explain the Bresenham's circle drawing algorithm and find the pixel locations of origin centered centre of 8 units. (16)

12. (a) Write a C program to design a shaft which is subjected to axial, bending and Torsional loads. The output from the above program should be transferred to any of the CAD packages. Explain in detail. (16)

Or

(b) Explain the various types of solid modelling in detail with examples. (16)

13. (a) Explain Warnock's Algorithm to hidden surface problem with examples. (16)

Or

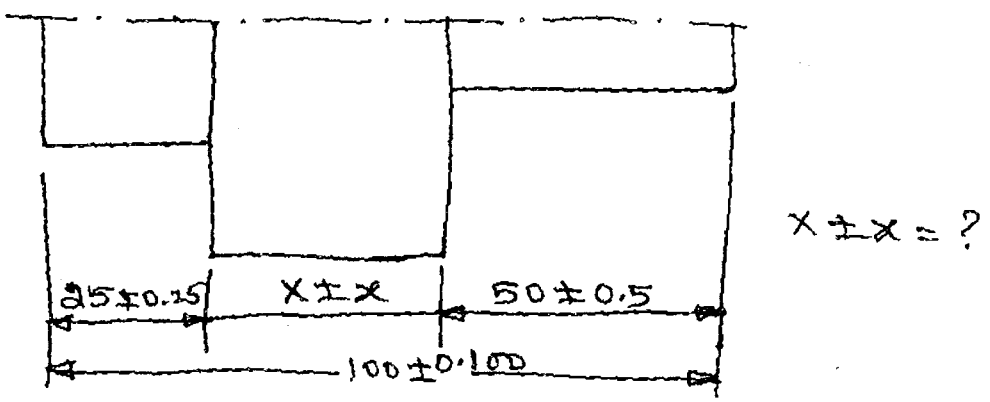
(b) What is parametric based geometry? How these principles are incorporated in CAD packages? Explain with examples. (16)

14. (a) (i) Explain the Boothroyd – Dewhurst method of Design for Assembly in detail. (8)

(ii) Show how the various mass property calculations can be made in CAD models. (8)

Or

(b) (i) Find the tolerance of the missing Dimension using (1) Worst case Tolerance Analysis (2) Statistical Analysis. (8)



(ii) Explain the various GD&T symbols and their role in controlling geometric accuracy of the part. (8)

15. (a) Explain the salient features of Fused Deposition Modelling (FDM) in detail. Also show how quick slice software helps in FDM process. (16)

Or

(b) Compare the processes of laminated object manufacturing (LOM) and solid ground closing (SGC) in detail. (16)

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