24/5/24

2024/TDC (CBCS)/EVEN/SEM/
CACCC-402T/125

TDC (CBCS) Even Semester Exam., 2024

COMPUTER APPLICATIONS

(4th Semester)

Course No. : CACCC-402T

(Computer Graphics)

Full Marks : 50
Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* of the following questions : 2×2=4

(a) Write the essential application of computer graphics.

(b) Define aspect ratio.

(c) Write the properties of video display devices.

2. Answer any *one* of the following questions : 6

(a) *(i)* Differentiate between DDA and Bresenham's line drawing algorithm.

(ii) Consider the line from (0, 0) to (4, 6). Use DDA algorithm to rasterize this line. 2+4=6

(b) *(i)* Define scan conversion.

(ii) Derive the expression for decision parameter used in Bresenham's circle algorithm. 2+4=6

UNIT—II

3. Answer any *two* of the following questions : 2×2=4

(a) Define window and viewport.

(b) Give the matrix representation for 2D scaling.

(c) List two polygon filling methods.

4. Answer any *one* of the following questions : 6

(a) Find a transformation of triangle $A(1, 0)$, $B(0, 1)$, $C(1, 1)$ by—

(i) rotating 45° about the origin translating one unit in x and y directions;

(ii) translating one unit in x and y directions and then rotating 45° about the origin. 3+3=6

(b) Write the algorithm to clip line using Liang-Barsky line-clipping algorithm.

UNIT—III

5. Answer any *two* of the following questions : 2×2=4

(a) What is the concept of 3D viewing?

(b) What is Bezier curve?

(c) State the concept of interpolation.

6. Answer any *one* of the following questions : 6

(a) What is curve? Explain B-spline curves and surfaces. 2+4=6

(b) Explain the following : 3+3=6

(i) Polygon surfaces

(ii) Quadratic surfaces

UNIT—IV

7. Answer any *two* of the following questions : 2×2=4

(a) Define parallel and perspective projection.

(b) What are the steps involved in 3D transformation?

(c) What do you mean by viewing pipeline and coordinates?

8. Answer any *one* of the following questions : 6

(a) Give the matrix representation for the following 3D transformations : 2+2+2=6

(i) Translation

(ii) Rotation

(iii) Scaling

(b) Develop the perspective transformation of an object onto the *xy*-plane with the center of projection at (100, 100, –100). What will be the projection of line segment *AB* with *A* (150, 250, 150) and *B* (250, 350, 100)?

UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) What is animation?

(b) Define *XYZ* color model.

(c) Explain YIQ model in brief.

(Continued)

10. Answer any *one* of the following questions : 6

(a) Describe depth-buffer model.

(b) Explain in brief the different animation techniques in computer graphics.

★★★