

Roll No. _____

Total No. of Pages : 02

Total No. of Questions : 07

BCA (Sem.-5)
COMPUTER GRAPHICS
Subject Code : UGCA1934
M.Code : 90317

Date of Examination : 30-11-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

SECTION-A

1. Write briefly :

- a) What is a Graphics Tablet?
- b) Define virtual reality.
- c) List five types of graphs.
- d) What are points and lines in computer graphics?
- e) What is the need for homogeneous coordinates? Give the homogeneous coordinates for translation, rotation and scaling.
- f) What is a frame buffer? Also, explain on what factors the quality of a displayed image depends?
- g) What is the direct method for scan-converting circles?
- h) How shearing is different than scaling?
- i) What is the difference between the boundary-fill algorithm and the flood-fill algorithm?
- j) What is Morphing in computer graphics?

SECTION-B

2. a) Compare and contrast raster and random-scan systems in computer graphics.
b) List the applications of Computer Graphics.
3. Describe in detail the Bresenham's line drawing algorithm. Using Bresenham's algorithm, find the coordinates of the pixels on a line segment with endpoints (2,3) and (5,8).
4. Explain the concepts of translation, scaling and rotation transformations in computer graphics. Explain how each transformation affects objects position, size, and orientation.
5. a) Write a note on area filling techniques.
b) Magnify the triangle with vertices A(0,0), B(1,1), C(5,2) to twice its size while keeping C(5,2) fixed.
6. Define projection. Explain various types of parallel and perspective projections. Also, derive the equations for perspective projection.
7. Write down the Cohen-Sutherland line clipping algorithm. How does it determine which parts of a line segment lie inside and outside the clipping window?

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.

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Total No. of Pages : 02

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Bachelor of Computer Applications (Sem.-5)

COMPUTER GRAPHICS

Subject Code : UGCA1934

M.Code : 90317

Date of Examination : 09-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

SECTION-A

1. Write briefly :

- a. What types of input devices are commonly used in modern computing systems?
- b. What are some common applications of virtual reality environments?
- c. How do flat panel displays achieve higher resolutions and refresh rates?
- d. How do algorithms for line drawing differ between raster and vector graphics?
- e. How does the choice of algorithm affect the quality and efficiency of circle drawing?
- f. What are the common types of 2D transformations used in computer graphics?
- g. What is perspective projection and how does it differ from parallel projection in computer graphics?
- h. What are some common applications of parallel projection in computer graphics?
- i. How do algorithms for ellipse drawing differ from those for circle drawing?
- j. Why have CRT displays become less common in recent years?

SECTION-B

2. How do clipping algorithms differ between vector and raster graphics? Given the line segment with end points (3, 4) and (8, 10) and the clipping rectangle with corners (4, 5) and (10, 8), apply the Cohen-Sutherland algorithm to clip the line segment.
3. What is the difference between homogeneous coordinates and Cartesian coordinates in 2D transformations? What is the result of applying the translation matrix $\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 3 \end{bmatrix}$ to the point (4, 5) after rotating this point on 60° around origin?
4. What are the advantages and disadvantages of LCD flat panel displays compared to traditional CRT displays? What is the difference between working of an LED and OLED flat panel display?
5. What is the perspective projection matrix and how does it transform 3D coordinates to 2D coordinates on the image plane? What are the different types of parallel projections and how are they used in computer graphics applications?
6. What are some common algorithms for filling of closed region in raster graphics? Discuss their working and how do these algorithms differ in terms of efficiency and accuracy?
7. What are some common circle drawing algorithms and how do they work? Explain the concept of Mid-point.

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