`Tribhuvan University

Faculty of Humanities and Social Sciences

OFFICE OF THE DEAN

2020

BCA Fifth Semester

Subject: Computer Graphics and Animation **Full Marks:60**

Time: 3hr **Pass Marks: 24**

Group B

Attempt any Six question (6*5=30)

2. What is computer graphics? Explain different application areas of computer graphics.

3. How can you draw a circle using mid-point circle algorithm? Explain with the algorithm.

4. Explain 3D basic geometric transformation with an example.

5. What is polygon clipping? Explain Sutherland Hodgman algorithm for polygon clipping.

6. Given a triangle with vertices A(2,3), B(5,5), C(4,3) by rotating 90 degree about the origin and then translating two unit in each direction. Use homogenous transformation matrix to find the new vertices of the triangle.

7. Explain the scan line algorithm for visible surface detection.

8. Explain the architecture of VR system with necessary components.

Group C

Attempts any TWO questions. **[2x10=20]**

9. Explain the working details of DDA line drawing algorithm? Digitize the line with endpoints (2,2) and (10,5) using Bresenham's line drawing algorithm. [5+5=10]

10. Write the different between object space method and image space method. Explain Z buffer algorithm for visible surface detection.

11. Derive the formula for windows to viewport transformation. Given a window bordered by (0,0) at the lower left and (4,4) at the upper right. Similarly, a viewport bordered by (0,0) at the lower left and (2,2) at the upper right. If a window at position (2,4) is mapped into the viewport. What will be the position of viewport to maintain same relative placement as in window? [5+5=10]

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2024

BCA Fifth Semester

Subject: Computer Graphics and Animation **Full Marks:60**

Time: 3hr **Pass Marks: 24**

Group B

Attempt any Six question (6*5=30)

2. Differentiate between beam penetration method and shadow mask method.How does raster scan system work?

3. How DDA works? Digitize the line segment with the endpoints(15,25) and (21,35)using DDA line drawing algorithm.

4. What is a viewport? Consider a window with lower left corner at (2,2) and upper right corner (5,10) and a viewport with left lower corner at (5,5) and upper right corner at (8,8). What will be the value of the point in the viewport after the window to viewport transformation if the point is (4,4) in the window?

5. Explain how scan line algorithm can be used for hidden surface removal.

6. Derive the transformation matrices for 3D rotation and reflections.

7. What is animation? Explain about applications of Virtual Reality.

8. Write short notes on (any two):

a) RGB color model b)2D shear transformation c) Computer Graphics Vs Image Processing

Group C

Attempts any TWO questions. **[2x10=20]**

9. Differentiate between boundary fill algorithm and flood fill algorithm in detail. Find the composite transformation matrix for anti-clockwise rotation of 60 degree about a point (2,3). Use it to rotate a triangle ABC with vertices A(4,3), (5,5) and (8,9).

10. What is visible surface detection? How object space method can be used for visible surface detection?Explain depth-sorting method for visible surface detection in detail.

11. How region codes are used in Cohen-Sutherland algorithm to clip the line segments? Find the clipping coordinates for lines PQ and RS with P(20,5), Q(40,30) and R(20,20), S(80,60)against the window with left upper corner (10,50) and right lower corner(50,10).