Tribhuvan University

Faculty of Humanities & Social Sciences

OFFICE OF THE DEAN

2024

Bachelor in Computer Applications

Course Title: Computer Graphics and Animation — **Full Marks: 60**

Code No: CACS 305 — **Pass Marks: 24**

Semester: V — **Time: 3 hours**

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. Differentiate between beam penetration method and shadow mask method. How does raster scan display system work? [3+2]
3. How DDA works? Digitize the line segment with the endpoints (15, 25) and (21, 35) using DDA line drawing algorithm. [2+3]
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? [1+4]
5. Explain how scan line algorithm can be used for hidden surface removal. [5]
6. Derive the transformation matrices for 3D rotation and reflections. [2.5+2.5]
7. What is animation? Explain about applications of Virtual Reality. [1+4]
8. Write short notes on (any two): [2.5+2.5]

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

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. Differentiate between boundary fill algorithm and flood fill algorithm in detail. Find the composite transformation matrix for anti-clockwise rotation of 60^0 about a point (2, 3). Use it to rotate a triangle ABC with vertices A (4, 3), (5, 5) and (8, 9). [5+3+2]
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. [2+2+6]
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). [4+6]