****

**Pre-Semester Examination 2070**

**Set A**

Bachelor Level/Second Year/ Forth Semester/ Science Full Marks: 60

**Computer Science and Information Technology (CSC 254)** Pass Marks: 24

(Computer Graphics) Time: 3 hours

*Candidates are required to give their answer in their own words as for as practicable.*

All questions carry equal marks.

**Attempt all the questions.**

1. Construct the Bezier curve of order 3 and with 4 polygon vertices A(1,1), B(2,3) C(4,3) and D(6,4).
2. Define Computer Aided Design (CAD)? Is it different from computer art? Explain with suitable examples.

OR

Distinguish between Raster and Vector graphics methods. When do we prefer? What?

1. What are the difference between parallel projection and perspective projection? Derive co-ordinates for Oblique projection at view plane.

OR

Derive the transformation matrix for window to viewport mapping transformation.

1. Consider 256 pixels X 256 scan lines image with 12-bit color. If 10 minutes video is required to capture, calculate the total memory required? What is virtual reality?
2. Describe the following terms(any two)
   1. Octree
   2. Computer Animation
   3. Polygon table
3. Justify that hidden surface removal is required in computer graphics. Explain in detail about depth buffer method.

OR

Explain in detail about scan line method. Justify that it is better than depth buffer method.

1. Given a clipping window P(0,0), Q(30,0),R(30,20), S(0,20) use the Cohen Sutherland algorithm to determine the visible portion of the line A(10,30) and B(40,0).

OR

Explain polygon clipping in detail. By using the Sutherland-Hodgemen Polygon clipping algorithm clip the following polygon.

A

B

C

1. A laser printer is capable of printing two pages (size 9 x 11inch) per second at resolution of 600 pixels per inch. How many bits per second does such device require?
2. Write the pseudo-code for Bresenham’s line drawing algorithm. How it is better than DDA?
3. Perform a 450 rotation of triangle A(0,0), B(1,1) C(5,2)
   1. About the origin
   2. About the point R(-1,-1)

****

**Pre-Semester Examination 2070**

**Set B**

Bachelor Level/Second Year/ Forth Semester/ Science Full Marks: 60

**Computer Science and Information Technology (CSC 254)** Pass Marks: 24

(Computer Graphics) Time: 3 hours

*Candidates are required to give their answer in their own words as for as practicable.*

All questions carry equal marks.

**Attempt all the questions.**

1. Complete the position of the Bezier curve p(t) at the times t=0.2, 0.5 and 0.9 when four control points are (2,3) (6,6) (8,1) and (4,-3).
2. Name the two most commonly used hardware input devices. Explain the working principle of wireless mouse.

OR

What are the advantages of computer graphics? Explain the term persistence, refresh rate, aspect ratio, resolution, pixel and frame buffer.

1. Consider 256 pixels X 512 scan lines image with 24-bit true color. If 20 minutes video is required to capture, calculate the total memory required? What is morphing?
2. What is the purpose of illumination models? Explain diffuse reflection in detail.

OR

Explain in detail about Gouraud shading model. Compare it with Phong shading model.

1. Describe the following terms(any two)
   1. Computer Animation
   2. Polygon mesh
   3. BSP tree
2. Use the Cohen Sutherland algorithm to clip line P1(70,20) and P2(100,10) against a window of lower left and corner(50,10) and upper right corner(80,40).

OR

Explain polygon clipping in detail. By using the Sutherland-Hodgemen Polygon clipping algorithm clip the following polygon.

A

B

C

1. What are the difference between parallel projection and perspective projection? Derive co-ordinates for perspective projection at view plane.

OR

Derive the transformation matrix for window to viewport mapping transformation.

1. Suppose we have a computer with 64 bits per word and a transfer rate of 2 mips. How long it take to fill the frame buffer of a 300 dpi laser printer with a page size of 9 inch by 11 inches?
2. Write down midpoint circle algorithm. Digitize the pixels for a circle centered at origin and radius 12 along the circle octant.
3. We have a triangle ABC with vertices A(3,4), B(7,4) and C(5,8). What is the transformation if the triangle is to be magnified twice its size keeping A(3,4) constant. Obtain new vertices of the triangle.