SRINIX COLLEGE OF ENGINEERING

2ND INTERNAL EXAMINATION-2021-22

Subject-CG   Semester-5th   **Branch-CSE**

Full Mark-100   **Time-2.30Hrs**

Sl.No   Answer All The Question(Part-A)   [2*10=20]

01   Define computer graphics

02   Define persistence, resolution and aspect ratio

03   Mention the types of line caps.

04   Coordinates of viewport are known as

a) World coordinates b)Polar coordinates c) Screen coordinates d)Cartesian coordinates

05   What are the different ways of specifying spline curve?

06   How will you clip a point?

07   Distinguish between view port and window port.

08   What is polygon mesh?

09   Define rendering.

10   Identify the data structures used to store the data about polygon surfaces
a) Vertex table b) Polygon table c) Edge table d) All of the above

Answer Any Eight Question   (GROUP-B)   [6*8=48]

01   Illustrate Bresenham's line drawing algorithm to draw a line with endpoint (10, 15) and (20, 25).

02   A triangle has its vertices at A(1, 1), B (3, 1) and C(2, 2). It is translated by 7 units along –ve X – direction and then rotated clockwise by 450 about P (0,2). Determine the new vertex positions of the triangle.

03   Derive a transformation matrix for reflection about the diagonal y= -x.

04   Consider the clipping window with vertices A(2,1), B(4,1), C(4,3) and D(2,3). Use Cohen-Sutherland algorithm to clip a line A(-4, -5) B(5,4) against this window (show all intermediate steps).

05   Write Scan line polygon fill algorithm. Explain each step of this algorithm by taking a suitable example.

06   Define blending function for B-Spilne curve.

07   Derive a transformation matrix for a scaling transformation with respect to any fixed point (xf, yf, zf).

08   What is parallel projection? Categorize parallel projection with respect to different view planes. Derive a transformation matrix for oblique parallel projection.

09   Make a classification of visible surface detection methods. Discuss how Painter's algorithm is helpful for visible surface detection. List its advantages and disadvantages.

10   Describe a basic illumination model (considering ambient light, diffuse reflection and specular reflection).

11   Explain the working of Gouraud surface rendering method.

12   Show that the two successive rotations about the origin are commutative.

Answer Any Two Questions   (GROUP-C)   [16*2=32]

01   Derive the incremental computation on which the mid-point circle algorithm is based. Write the different steps of this algorithm. Use this algorithm to draw a circle with radius 4 cm and center located at (5,10).

02   What is Bezier curve? Write the basic equations for generating Bezier curve. Discuss its properties. Derive Bezier matrix for cubic Bezier curve.

03   Define perspective projection. Derive perspective projection transformation matrix. Discuss the special cases associated with this.

04   Explain the working of the following algorithms :
a. Depth buffer
b. A-buffer
List out their relative advantages and disadvantages.