1. (a) What are the purpose of using the following file formats?
   (i) TIFF
   (ii) PNG
   (iii) JPEG
   (iv) BMP
   (v) CDR

(b) Write the DDA algorithm for line generation and modify the same for negative sloped lines.

(c) List two main differences between the following:
   (i) Cohen Sutherland line clipping algorithm and cyrus beck line clipping algorithm
   (ii) Scan line polygon filling algorithm and flood fill algorithm.
(d) Perform 45° rotation of a ΔABC; A (0,2), B (−1,−1), C(1,−1) about the origin.

(e) What do you mean by Foreshortening factor? How foreshortening factor is used to identify that projection is isometric, Dimetric or Trimetric?

(f) What is the utility of tabular representation of polygon surface? Can you implement a polygon surface with just a vertex table and an edge table? Justify your answer.

(g) What are the maximum number of objects that can be handled by the Z-buffer algorithm? What will happen if Z-buffer algorithm is used and it is found that two polygons have same Z-value?

(h) What are the merits and demerits of phong shading?

(i) Explain the following:
   (i) Stochastic Animation and its area of application
   (ii) Image editing tools and their selection criteria

2. (a) Differentiate between
   (i) Caligraphic display device and Raster Scan display device
   (ii) Drawing and Painting

(b) Write the Mid point circle generation algorithm and use the same to produce a circular arc of radius 8 units in the first quadrant from $x = 0$ to $x = y$. 

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(c) Explain all the four cases of the Sutherland-Hodgman polygon clipping algorithm.

(d) Determine the number of memory bits required for a 4 bit - plane frame buffer for a 512 × 512 raster.

3. (a) Determine the final coordinates of a polygon ABCD, A (1,4), B (-4,1) C (-1, -1), D (2, -2) when it is scaled up to twice its size with respect to an arbitrary point P (1,1).

(b) Find the condition under which we have:
\[ S_{s_x} S_{s_y} \cdot R_\theta = R_\theta \cdot S_{s_x} S_{s_y} \]
Where \( S_{s_x} S_{s_y} \) is scaling with scaling factors \( S_x \) and \( S_y \) in \( x \) and \( y \) direction respectively and \( R_\theta \) is rotation with an angle \( \theta \).

(c) Obtain a transformation matrix for perspective projection for a given object onto \( x = 5 \) plane, as viewed from (10,0,0).

(d) Define a projection. Give the various types (taxonomy) of projection.

4. (a) A Cubic Bezier curve has control points \( P_0 (0,0); P_1 (5,40); P_2 (40,5); P_3 (50,15) \). Determine 2 more points on the same Bezier curve.

(b) Explain the scan line method of visible surface detection in computer graphics.

(c) Explain the generation of surface of revolution with the help of an example.
(d) How Ambient, Diffused and specular reflection contributes to the resulting intensity of reflected ray of light? Give mathematical expression for the same.

5. (a) Differentiate between (Any two)
   (i) Frame animation and Sprite Animation
   (ii) Scripting Systems and Parameterised Systems
   (iii) Computer generated and Computer Assisted Animation.

(b) What do you mean by simulating acceleration in animation? What type of acceleration will be simulated by a straight line function? Draw suitable graph for the mathematical function used to describe the frame spacing regulation when positive acceleration is desired to be produced.

(c) Differentiate between
   (i) Analog sound and Digital sound
   (ii) Lossless Audio formats and Lossy Audio formats

(d) List the characteristics of any two types of authoring tools.