Sl. No. 07   Q.P: 6063

12|12|17   (M)

Unique Paper Code :   2341503
Name of the paper :   Computer Graphics(ER)
Name of the Course :   B.Tech (Computer Science)
Semester :   V(ER)
Duration of Examination :   Three Hours
Maximum Marks: 75 Marks

F-9

Section A is compulsory
Attempt any four questions from section B.
Parts of a question must be answered together.

Q1 a) Discuss the cases of trivial acceptance and trivial rejection in Cohen Sutherland Line Clipping algorithm.   4

b) List the properties of Bezier Curves.   2

c) What do you mean by interlacing in raster display devices? What is its advantage?   3

d) Discuss two ways in which motion of an object can be specified in an animation system?   3

e) Discuss a method to draw a thick primitive?   3

f) What do you mean by perspective projection? What are various types of perspective projections?   5

g) Briefly discuss the architecture of Random Scan Display Systems.   4

h) Write a 2-D transformation matrix using homogenous coordinates for the following: 3+2
  - i) Rotate about a fixed point (1,1)
  - ii) Double the size of the object.

i) Define the following :   2*3=6
  - i) Vertical Retrace
  - ii) Half toning
  - iii) Specular Reflection

Section-B

Q2 a) Derive the required decision variables to scan convert the first quadrant of an ellipse.   4

b) Calculate points on a line from (1,1) to (8,5) using Bresenhams line drawing algorithm.   6

Q3 a) Differentiate between Phong shading and Gouraud shading.   4

b) Consider a clip rectangle with end points (10,10), (20,10), (20,20), and (10,20). Using Cohen Sutherland Line clipping algorithm clip the line segment from (8,15) to (15,22).   6

Q4 a) Give the transformation matrices to scale the triangle ABC to thrice it's size with respect to C where (0,0), (1,1), and (5,2) are the co-ordinates of the points A,B, and C respectively.   6

b) Show that origin is transformation invariant under a 2X2 general transformation matrix.   4

Q5 a) Consider the triangle ABC with A(0,0), B(5,0), and C(0,5). Apply shearing of 3 units along Y-axis and 4 units along X-axis. Use homogeneous coordinates.   3

b) Differentiate between Cavalier and Cabinet projections.   4

c) List and explain the data structures used in scan line fill algorithm.   3

Q6 a) What is a Chromacity Diagram?   2

b) Briefly explain any two the data structures used to represent a polygon mesh.   4

c) Explain Warnock's Area Sub Division algorithm with an example.   4

Q7 a) Define Morphing. Specify the rules to equalize the set of edges in key   2+3=5

frames 'k' and 'k+1'.

b) Consider a line segment AB parallel to the z axis with end points A(3,2,4,1) and B(3,2,8,1). Perform a perspective projection onto z=0 plane from centre of projection at $z_c = -2$ 5