



SE-6763

B. E. - III (Sem. V) (Computer Engg.) Examination
April / May - 2011
Computer Graphics

Time : 3 Hours]

[Total Marks : 100

Instructions :

नीचे दशांशके निशानीवाणी विगतो उत्तरवडी पर अवश्य कभवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. - 3 (SEM. 5) (COMPUTER ENGG.)

Name of the Subject :
Computer Graphics

Subject Code No. : 6 7 6 3 Section No. (1, 2,.....) : 1&2

Seat No. :

Student's Signature

1. Use Separate answer sheet for each section
2. Make assumption whenever required.
3. Numbers on the right indicate maximum marks.

SECTION I

Q.1 (A) State whether the following statements are TRUE or FALSE : 4

1. Use of the color table can provide a reasonable number of simultaneous colors without requiring the large frame buffer.
2. In 4-connected method, the pixels (x+1, y) and (x-1, y+1) are checked for its color considering seed pixel is (x, y).
3. The typical application of touch panels is for the selection of processing options that are represented graphical icons.
4. Endpoint codes of a line segment are 0101 and 0100. This line will be partially invisible.

(B) Do As Directed :

1. Which of the following techniques is used in Midpoint Subdivision algorithm?
(a) Binary Search (b) Bubble Sort
(c) Linear Search (d) Sequential Search
2. How many frames per second are required if the animation is to be played back on a video monitor? 1
3. What do you mean by Rasterization? Explain with example. 2
4. Define the Following Terms : 2
(i) Output Primitives.
(ii) Business Visualization.

- (C) (i) Write and Explain the DDA line drawing algorithm. Also write down its limitations. 6
(ii) Use the same algorithm to rasterize the line with endpoints (0,0) and (-5,5). Show all the necessary calculations. 4
- Q:2 (A) (i) Write and explain the Edge Flag algorithm for filling the interior region of the polygon. 5
(ii) Trace out the same for the polygon with vertices A(1,1), B(8,1), C(8,6), D(5,3) and E(1,7). 5
- OR
- (A) Write the Mid-point Ellipse algorithm assuming the start position is $(0, i_y)$ and points are to be generated along the curve path in clockwise order. 10
- (B) Discuss the architecture of raster-graphics system with a display processor. 5
- Q:3 (A) Attempt any **TWO** from the following: 8
- 1 Explain Run Length Encoding for color pictures with example.
 - 2 Identify and explain attributes associated with fill area and line.
 - 3 Suppose an RGB raster system is to be designed using an 8 – inch by 10 – inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bits per pixel in the frame buffer, how much storage in bytes do we need for the frame buffer?
- (B) Enlist and explain Various application areas of Computer Graphics. 7

SECTION II

- Q:4 (A) Answer the following. 10
1. Moving of objects respect to back ground image is _____ type of Transformation.
 2. Reflection is _____ degree rotation.
 3. Anti clockwise rotation is _____ rotation.
 4. _____ Projection is used in cinema hall for display the picture.
 5. Define term: Shearing
 6. View port
 7. Pure Reflection
 8. In YIQ color model, _____ information is contained in the Y parameter.
 9. _____ methods generate intensity variations with a one to one mapping of points in scene to the display pixels.
 10. Co-ordinate transformation.
- (B) What is projection? List out the type of projection & Derive transformation matrix for perspective projection. 10
- Q:5 (A) A triangle ABC has co-ordinates A(4,4), B(1,1),C(3,4). The triangle is first rotated 90 degree about origin then scale by 3 in X direction & then translate 2 in Y direction. Derive 3X3 resulting transformation matrix which performs above operation using this matrix. Find the new co-ordinate of triangle. 7

OR

- (A) (1) Find the form of matrix for reflection about line L. where line is $y=mx+c$. 4
 (2) Prove this matrix is Pure Rotation 3

$$\begin{vmatrix} 1-t^2/(1+t)^2 & 2t/(1+t)^2 \\ -2t/(1+t)^2 & 1-t^2/(1+t)^2 \end{vmatrix}$$

- (B) Find a transformation Av which aligns a given vector V with the vector K along the positive z axis. Where $V=aI+bJ+cK$ 8

OR

- (B) Find the transformation for mirror reflection with respect to the xy plane. 8

Q:6 Answer any Three. 15

1. RGB Color model
2. Fractals and Type of Fractals.
3. Homogenous Co-ordinates
4. z-Buffer Algorithm
5. 3-D transformation.