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Code: DC09 **Subject: COMPUTER GRAP**
Time: 3 Hours **Max. Marks: 1**

JUNE 2011

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. The resolution of a 2×2 inch image that has 512×512 pixels is

(A) 128 pixels per inch **(B)** 512 pixels per inch
(C) 1024 pixels per inch **(D)** 256 pixels per inch

b. Light pen is a

(A) Input device **(B)** Output device
(C) Memory device **(D)** Plotting device

c. To move the image or object from one position to another is called as _____.

(A) Scaline **(B)** Rotation
(C) Translation **(D)** Skewing

d. A line with starting points as (2, 3) and ending point (6, 18) is given. The slope of line is

(A) 2 **(B)** 4
(C) 5 **(D)** 3

e. The matrix for rotation clockwise direction is

(A) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ **(B)** $\begin{bmatrix} \cos\theta & \sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$

(C) $\begin{bmatrix} \cos\theta & -\cos\theta \\ \sin\theta & \sin\theta \end{bmatrix}$ **(D)** $\begin{bmatrix} \cos\theta & \sin\theta \\ -\cos\theta & \sin\theta \end{bmatrix}$

f. There could be maximum of _____ vanishing points along the three orthogonal axes.

(A) 2 **(B)** 4
(C) 5 **(D)** 3

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g. Short term for picture element is called as _____

(A) Buffer **(B)** Vector
(C) Pixel **(D)** Graphic

h. The method for selecting and enlarging portions of a drawing is called _____

(A) windowing. **(B)** clipping.
(C) viewport. **(D)** none.

i. DDA stands for

(A) Digital Decision Analysis **(B)** Decision Divide Analysis
(C) Digital Differential Analysis **(D)** Digital Differential Analyzer

j. If the line is entirely within the window then both points will have out codes

(A) 1111 **(B)** 1000
(C) 0000 **(D)** 1011

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. How computer graphics is used in CAD of architecture, mechanical and aeronautical? **(6)**

b. What is the principle of polarize light? How it is used in LCD? **(10)**

Q.3 a. Explain the following input devices:

(i) Light pens
(ii) Joy sticks
(iii) Image scanner **(9)**

b. Write a DDA line algorithm for representing a line in third quadrant. **(7)**

Q.4 a. Describe rubber band methods and dragging. **(7)**

b. Write Bresenham's circle drawing algorithm. **(9)**

Q.5 a. Find the normalization transformation that maps a window lower left corner is at (1, 1) and upper right corner is at (3, 5) on to
(i) viewport that is the entire normalized device screen and
(ii) a viewport that has lower left corner at (0, 0) and upper right corner. **(8)**

b. Describe Cohen-Sutherland line clipping algorithm. **(8)**

Q.6 a. Explain generation of bar charts and pie charts. **(8)**

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b. Find the matrix for mirror reflection with respect to the plane pa through the origin and having a normal vector whose direction N=I+J+K.

Q.7 a. Using the origin as the centre of projection derive the perspective transformation onto the plane passing through the point $R_0(x_0, y_0, z_0)$ and having the normal vector $N = n_1I + n_2J + n_3K$. **(8)**

b. Explain Z-buffer algorithm. What are advantages and disadvantages of Z-buffer algorithm? **(8)**

Q.8 a. Write brief note on Octree representation **(8)**

b. Explain phong specular reflection illumination model. **(8)**

Q.9 a. What are the various hardware requirements of multimedia components and explain it. **(8)**

b. Write short note on the following:

(i) Windows Paint Brush
(ii) CRT **(4×2)**

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