

**DiplETE – CS (Current Scheme)**

Time: 3 Hours

**JUNE 2015**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**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 maximum number of points displayed on CRT without overlapping is known as.
- (A) Pixel (B) Resolution  
(C) Aspect ratio (D) Persistence
- b. The interactive computer graphics provides a \_\_\_\_\_ way communication between computer and user.
- (A) one (B) two  
(C) three (D) four
- c. Return path of the electron beam to the top left corner of the screen after refreshing one frame is called
- (A) Horizontal retrace (B) Backtracking  
(C) Vertical retracing (D) Interlacing
- d. \_\_\_\_\_ is used to control the basic display properties of output primitives.
- (A) Attribute parameter (B) setpixel  
(C) getpixel (D) putpixel
- e. Data structure used to model seed fill algorithm for boundary- specified region is \_\_\_\_\_.
- (A) stack (B) queue  
(C) linked list (D) doubly linked list

**Code: DC66**
**Subject: COMPUTER GRAPHICS**

f. Coordinates of a point (x,y) when reflected about a straight line  $y = -x$  in 2-Dimension is.

(A) (-x, -y)

(B) (y, x)

(C) (-x, y)

(D) (-y, -x)

g. \_\_\_\_\_ is a process which gives a special effect of melting down of one image into another.

(A) Projection

(B) Morphing

(C) Rendering

(D) Rasterization

h. Transformation which compresses or expands the dimensions of an object.

(A) Translation

(B) Scaling

(C) Rotation

(D) Reflection

i. What is the full form of VGA?

(A) Video Graphics Array

(B) Visual Graphics Array

(C) Volatile Graphics Array

(D) None

j. The size of frame buffer needed to store 12 bits per pixel for the raster system with resolution of 1280X1024 is \_\_\_\_\_.

(A) 1860KB

(B) 1820KB

(C) 1920KB

(D) 1960KB

**Answer any FIVE Questions out of EIGHT Questions.**

**Each question carries 16 marks.**

**Q.2** a. What are the main components of Graphics system? Explain with the help of suitable diagram. (8)

b. Highlight the major differences between raster scan and random scan display. (4)

c. What are the major application area of Computer Graphics? (4)

**Q.3** a. State and explain DDA algorithm for line drawing along with its drawbacks. (6)

b. Define polygon filling. Explain boundary filling for a polygon with suitable example. (10)

**Q.4** a. Determine the transformation matrix to reflect a polygon with vertices A(-1,0), B(0, 2), C(1, 0) about a line  $y = x + 2$ . (6)

- b. Show that 2D rotation followed by scaling operation is commutative if  $S_x = S_y$ . (5)
- c. Explain general fixed point scaling along with its composite transformation matrix. (5)
- Q.5** a. Explain Sutherland-Hodgeman algorithm for polygon clipping and give reason for what type of clipping regions it is not suitable? (6)
- b. Using Cohen-Sutherland line clipping, compute the visible portion of the line segment  $A(0.6, 0.8)$ ,  $B(2.4, 1.7)$  for window  $(x_{min}, y_{min}) = (0, 0)$  and  $(x_{max}, y_{max}) = (2, 2)$ . (4)
- c. Determine the parametric representation of line segment between position vector  $P_1(2, 4)$  and  $P_2(6, 4)$  (6)
- Q.6** a. Describe the transformation matrices for 3D rotation and 3D reflection. (6)
- b. Describe perspective projection with the help of neat diagram. (6)
- c. Define Quadric Surfaces. (4)
- Q.7** a. Explain why there is a need for visible surface detection? Also, differentiate between object precision and image precision methods for detecting visible surface. (6)
- b. Describe Back face hidden surface removal algorithm along with its limitations. (10)
- Q.8** a. What do you mean by computer-assisted animation? Differentiate it with computer-generated animation. (8)
- b. Write short notes on: (8)
- (i) Frame-by-frame animation
- (ii) Keyframes
- Q.9** a. Explain the term multimedia. What are various applications of multimedia? (6)
- b. Briefly describe how audio plays a major role in multimedia development? (5)
- c. What is CD-ROM drive and how it differs from DVD? (5)