

DipIETE – CS (Current Scheme)

Time: 3 Hours

December 2016

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. In D×F Files, which section contains non graphical parts of the drawing?
 (A) TABLES (B) CLASSES
 (C) OBJECT (D) EOF
- b. _____ is used to control the basic display properties of output primitives.
 (A) Attribute parameter (B) setpixel
 (C) getpixel (D) putpixel
- c. A point in two dimensional planes is represented using homogeneous coordinate system as
 (A) (x, y, 1) (B) (x, y, 0)
 (C) (x, y, w) (D) (x/w, y/w, 1)
- d. Which of the following is NOT a component of Multimedia?
 (A) Polygon filling (B) Animation
 (C) Sound (D) Video
- e. Which of the following is correct about MPEG?
 (A) It is an image format (B) It is an audio format
 (C) It is a video format (D) It is text format
- f. Following is not a type of transformation.
 (A) Translation (B) Pulling
 (C) Rotation (D) Scaling
- g. Aliasing means
 (A) Rendering effect (B) Shading effect
 (C) Staircase effect (D) Cueng effect

- h. Parallel projection is characterized by the
 (A) view plane alone
 (B) direction of projection and the view plane
 (C) centre of projection and the view plane
 (D) centre of projection alone
- i. 12 bit pixel values in a lookup table representation consists of _____ no. of entries.
 (A) 4096 (B) 12
 (C) 256 (D) 8
- j. Which of the following is not an input device?
 (A) Light pen (B) Optical mouse
 (C) Digitizer (D) None of these

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

- Q.2** a. What are the advantages of Interactive Computer Graphics? What are the uses of Computer Graphics? (4+3)
- b. Give very brief description of
 (i) Input Devices (ii) GUI (3×3)
 (iii) Tablet
- Q.3** a. Digitize a line from (1, 2) to (12, 18) on a raster screen using Bresenham's straight line algorithm. (8)
- b. Explain Seed Fill algorithm for polygon filling with a suitable example. (8)
- Q.4** a. Derive the Transformation matrix in 2D for: (2×2)
 (i) Shearing about x axis
 (ii) Reflection about y axis
- b. Explain the steps required to rotate an object in 3D about an arbitrary point. (6)
- c. Compute the transformation matrix for reflecting a point (x, y) with respect to line $y = x$ and hence find the new coordinates for the point P(2, -4). (6)
- 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 (xmin, ymin)=(0, 0) and (xmax, ymax)=(2, 2). (4)

- c. Define the terms: (2×3)
 (i) Windowing (ii) Clipping
 (iii) Viewport

- Q.6** a. Apply 3D geometric transformations to make the given tetrahedron $ABCD$ rotate about the x axis, making it erect with its base ABC resting on the x - z plane. Next, magnify it four times about a fixed point $P[1, 1, 2]$. (8)

$$\begin{bmatrix} A \\ B \\ C \\ D \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 1 \\ 2 & 0 & 0 & 1 \\ 1 & \sqrt{5} & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

- b. What is orthographic projection? Explain the term isometric, oblique and perspective projection. (8)

- Q.7** a. Write Z- Buffer algorithm for hidden surface removal. (8)

- b. What are the characteristics of Bezier Curves? (8)

- Q.8** a. Explain different video formats. (8)

- b. Write short notes on: (4×2)
 (i) Frame-by-frame animation (ii) Keyframes

- Q.9** a. What are the various components of multimedia? How do they affect human perception and understanding? (8)

- b. What is multimedia storage? Explain. (8)