

DipIETE – CS (Current Scheme)

Time: 3 Hours

JUNE 2017

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. A monitor is having resolution of 640 x 480, its aspect ratio will be _____.

- (A) 1.33 (B) 0.75
(C) 1.35 (D) 1.7

b. Consider a raster system with a resolution of 1024 by 768. What is the size of the raster needed to store 8 bits per pixel.

- (A) 768 Kb (B) 1024 Kb
(C) 786 Kb (D) 1042 Kb

c. Which of the following is true about aliasing?

- (A) Staircase (B) Picket fence
(C) Unequal brightness (D) All of these

d. If (x, y) is a point outside the clipping window then according to the Cohen-Sutherland algorithm its code will not be _____.

- (A) 1000 (B) 0000
(C) 0100 (D) 0010

e. Reflection of a point about x-axis, followed by a counter clockwise rotation of 90° , is equivalent to reflection about the line _____.

- (A) $X = -Y$ (B) $Y = -X$
(C) $X = Y$ (D) $X + Y = 1$

f. The clockwise rotation of 2D object is similar to clockwise rotation of _____ in 3D.

- (A) About X axis (B) About Y axis
(C) About Z axis (D) None of these

g. The depth of the original object becomes $\frac{1}{2}$ of the original object in _____ projections.

- (A) Cavalier (B) Cabinet
(C) Triametric (D) Diametric

- h. The method which is based on the principle of checking the visibility point at each pixel position on the projection plane are called _____.
- (A) Object-space method (B) Image-space method
(C) Both (A) & (B) (D) None of these
- i. In animation, a _____ is a frame in which the artwork differs from that of the previous frame
- (A) key frame (B) lock frame
(C) cell (D) motion tween
- j. Cutting down the size of a video clip is known as?
- (A) Clipping (B) Cutting
(C) Cropping (D) Trimming

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

- Q.2** a. Compare random and raster displays. (8)
- b. For a raster monitor of resolution 640 X 480 pixels a non-interlaced scanning is used with horizontal and vertical retrace times of 20 μ s each. Assume a scan rate of 60 frames. Calculate the time available to display a pixel. (4)
- c. Define:
- (i) Interlacing
(ii) Pixel
(iii) Resolution
(iv) Refresh rate (4)
- Q.3** a. What are the different methods for character generations? Explain any one method in brief. (8)
- b. Consider the line from (2, 2) to (6, 5). Use Bresenham's line drawing algorithm to rasterize this line. (8)
- Q.4** a. Derive the transformation matrix for rotation about an origin by an angle θ . (6)
- b. Compute the compound transformation matrix to scale the Y-coordinate to make the image twice as tall, shift it down by one unit and then rotate clockwise by 30° . (6)
- c. Prove that $S_x = 1/\cos(\theta)$, where S_x is the scaling factor and θ is the angle of rotation. (4)
- Q.5** a. Use Cohen-Sutherland line clipping method to clip a line starting from (-13,5) and ending at (17,11) against the window having its lower left corner at (-8,-4) and upper right corner at (12,8). (8)

- b. Define window and viewport. Derive the viewing transformation matrix if the lower left window coordinates are $(X_{w_{min}}, Y_{w_{min}})$ and upper right window coordinates are $(X_{w_{max}}, Y_{w_{max}})$ where as the lower left viewport co-ordinates are $(X_{v_{min}}, Y_{v_{min}})$ and upper right viewport coordinates are $(X_{v_{max}}, Y_{v_{max}})$. (8)
- Q.6** a. Discuss the various properties of Bezier curve. (4)
- b. Why projection is required? What are the different types of perspective projections? Explain each type in brief. (8)
- c. Give the 3D transformation matrix for
(i) Rotation about X-axis
(ii) Rotation about Y-axis
(iii) Reflection about XY plane
(iv) Scaling (4)
- Q.7** a. Explain depth-buffer method for removing hidden surfaces? What are the advantages and disadvantages of this method? (8)
- b. What is Coherence? What are the different types of Coherence? Explain each in brief. (8)
- Q.8** a. Discuss the different steps used for the design of an animation sequence. (8)
- b. Write a short note on animation software. (8)
- Q.9** a. List and explain the different components of multimedia. (10)
- b. What is the different digital video file formats used in multimedia? Explain each in brief. (6)