

AMIETE – CS/IT (New Scheme)

Time: 3 Hours

December - 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. Lower persistence phosphorus is used in

| | |
|--------------------|-------------------|
| (A) Animation | (B) Simple object |
| (C) Complex object | (D) All of these |
- b. The maximum number of points displayed on CRT without overlapping is known as

| | |
|------------------|-----------------|
| (A) Pixel | (B) Resolution |
| (C) Aspect ratio | (D) Persistence |
- c. _____ is a process which gives a special effect of melting down of one image into another.

| | |
|----------------|-------------------|
| (A) Projection | (B) Morphing |
| (C) Rendering | (D) Rasterization |
- d. The z-buffer algorithm is used to _____.

| | |
|--|---------------------------------------|
| (A) Find the largest depth value z | (B) Find the smallest depth value z |
| (C) Find the average of the frame buffer | (D) Calculate the intensity at (x, y) |
- e. The point at which a set of projected parallel lines appear to converge is called

| | |
|-----------------------|-----------------------|
| (A) convergence point | (B) vanishing point |
| (C) point of illusion | (D) point of delusion |
- f. _____ is used to regulate the flow of electrons in CRT?

| | |
|-----------------------|------------------------|
| (A) Electronic Gun | (B) Focusing electrode |
| (C) Control electrode | (D) All of these |

- g. A face is called a back face with respect to \vec{v} if the angle between the normal vector \vec{n} to the face satisfies
- | | |
|---|---|
| <p>(A) $\vec{n} \cdot \vec{v} \geq 0$.</p> <p>(C) $\vec{n} \cdot \vec{v} \leq 0$.</p> | <p>(B) $\vec{n} \cdot \vec{v}$ does not exist</p> <p>(D) $\vec{n} \cdot \vec{v} = -1$</p> |
|---|---|
- h. For the line joining (3, 5) and (15, 6) the location of the second pixel is at
- | | |
|-------------------------------------|--|
| <p>(A) (3, 6)</p> <p>(C) (4, 6)</p> | <p>(B) (4, 5)</p> <p>(D) None of these</p> |
|-------------------------------------|--|
- i. The AND operation of the codes of the end points of a line completely outside the clip window
- | | |
|---|---|
| <p>(A) may be equal to (0000)</p> <p>(C) Both (A) & (B)</p> | <p>(B) will never be equal to (0000)</p> <p>(D) None of these</p> |
|---|---|
- j. Oblique projection with an angle of 45° to the horizontal plane is called as _____.
- | | |
|---|---|
| <p>(A) isometric projection</p> <p>(C) cabinet projection</p> | <p>(B) cavalier projection</p> <p>(D) None of these</p> |
|---|---|

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

- Q.2** a. List some of the application areas where computer graphics can be used? (6)
- b. Write down the difference between Random Scan and Raster Scan Display systems. (6)
- c. What do you mean by frame buffer? Draw a block diagram showing the technique for scanning out an image from frame buffer to display surface. (4)
- Q.3** a. Describe DDA line drawing algorithm. Draw a line from (24,24) to (36,33) using DDA algorithm. (8)
- b. Write Midpoint Circle drawing algorithm to draw one eighth part of a circle with centre **(0, 0)** and Radius **10**. (8)
- Q.4** a. Explain scan line polygon filling algorithm with the help of example. (8)
- b. Describe the Cohen-Sutherland technique for clipping a line with respect to a rectangular window. (8)

- Q.5** a. Define parallel and perspective projections. Give various types of parallel and perspective projections. (8)
- b. Draw the result of the following 2D transformation on the graph paper. Be sure to label the two resulting squares, origin and the axes. (include the order applied) (8)
- (i) A unit square is translated $t_x=2, t_y=2$ followed by a uniform scaling of 2.5
- (ii) A unit square is translated $t_x=4, t_y=5$, then rotated by an angle $\theta =45^\circ$.
- Q.6** a. Describe how phong shading model is different from Gouraud shading model? Which one is better to use? (8)
- b. Describe the methods for specifying the information needed to construct and manipulate a model. (8)
- Q.7** a. Explain Interactive picture construction Techniques in brief. (10)
- b. Explain the designing of a Graphical User Interface (GUI) in OpenGL. (6)
- Q.8** a. What is animation? What are the different methods to produce real time animation? (8)
- b. Describe the various techniques that can be incorporated into graphics packages to aid the interactive construction of pictures. (8)
- Q.9** Write a brief note on the following: (4×4)
- (i) Octree representation
- (ii) Cyrus Beck algorithm
- (iii) Morphing
- (iv) OpenGL