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 BCA(III) — 305

2019

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

*Answer **five** questions in which*

Q. No. 1 is compulsory.

1. Choose the correct alternative of the following :

(a) Vector graphics is composed of :

(i) Pixels

(ii) Paths

(iii) Palett

(iv) None of these

(b) The quantity of an image depend on :

(i) No. of pixel used by image

(ii) No. of line used by image

(iii) No. of resolution used by image

(iv) None of these

(c) In Bresenham's algorithm, while generating a circle, it is easy to generate :

(i) One octant first and other by successive rotation

(ii) One octant first and other by successive translation

(iii) One octant first and other by successive reflection

(iv) All octants

(d) Which of the following technique is used in Midpoint Subdivision algorithm ?

(i) Heap sort

(ii) Bubble sort

(iii) Binary search

(iv) Linear search

(e) Graphics and image processing technique used to produce a transformation of one object into another is called ?

(i) Half toning

(ii) Morphine

(iii) Animation

(iv) None of these

(f) Pixel can be arranged in a regular :

(i) One dimensional grid

(ii) Two dimensional grid

(iii) Three dimensional grid

(iv) None of these

(g) A scanner is specified by :

(i) Dosts per inch it can scan

(ii) Length of paper it can scan

(iii) Vertical and Horizontal Resolution

(iv) None of these

(h) The method which used either delta x or delta y, whichever is larger, is chosen as one raster unit to draw the line this algorithm is called :

(i) DDA Line Algorithm

(ii) Midpoint Line Algorithm

(iii) Bresenham's Line Algorithm

(iv) Generalized Bresenham's Algorithm

2. (a) What is the fundamental difference in the method of operation of a monochrome CRT and Coloured CRT ?

(b) Describe the function of Image Scanner.

3. What are graphics primitives ? Mention some typical graphics primitives that a package may provide.

4. Compare the merits and demerits of Raster scan and flat panel displays. Differentiate between raster & vector graphics.

5. Explain graphics standards and difference between primitive standards and non-primitive standards.

6. (a) What is Cavalier Projection ? And what is cabinet projection ?

(b) List various transformations in two and three Dimensional Transformations. Explain each.

7. Compare the Digital Differential Analyzer (DDA) and Bresenham's line drawing algorithms. What are the advantages of the Bresenham algorithm ?

8. (a) What is the difference between window and viewport ? What is the use of normalized device co-ordinate system ?

(b) Derive the transformation matrix for window to viewport mapping transformation.

9. Describe the following :

(a) Polygon rendering methods

(b) Phong illumination model

10. Write short notes on any **two** the following :

(a) Tweening and Morphing

(b) LCD

(c) Multimedia Hardware

(d) Soft copy

(e) CRT

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2017

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The figures in the margin indicate full marks.

*Answer **five** questions in which*

Q. No. 1 is compulsory.

1. Choose the correct alternative of the following : 2×8 = 16

(a) The software AUTOCAD is used for :

(i) Geographical Mapping

(ii) Animation

(iii) Engineering drawings

(iv) Simulation

(b) The standard refresh rate of a Ra Display is :

(i) 60Hz

(ii) 80Hz

(iii) 75Hz

(iv) 30Hz

(c) The electron gun in a CRT screen is placed inside a vacuume tube at :

(i) Circumference of the screen

(ii) Centre of the screen

(iii) Radius of the screen

(iv) Anywhere in the screen

(d) What is true about plasma :

(i) It is the fourth known state of a material

(ii) It converts electrical energy into light energy

(iii) Plasma panel uses Neon gas

(iv) All of the above

(e) Convert p(s, s) to polar co-ordinate system :

(i) $R = \sqrt{25}, \theta = 45^\circ$

(ii) $R = 5\sqrt{2}, \theta = 90^\circ$

(iii) $R = 3\sqrt{3}, \theta = 60^\circ$

(iv) $R = 5\sqrt{2}, \theta = 45^\circ$

(f) For matrix multiplication :

(i) No. of rows of first matrix must equal to no of rows of second matrix

(ii) No. of columns of first matrix must equal to no. of columns of second matrix

(iii) No. of rows of first matrix must equal to no. of columns of second matrix

(iv) No. of columns of first matrix must equal to no. of rows of second matrix

(g) Which one is not 2-D transformation operation ?

(i) Sealing

(ii) Translation

(iii) Mirroring

(iv) Execution

(h) According to Bresenham's Circle drawing algorithm the circle has a :

(i) 4-way symmetry

(ii) 6-way symmetry

(iii) 8-way symmetry

(iv) 9-way symmetry

2. (a) Describe the important multimedia hardware.

(b) Enumerate five potential application of multimedia other than applications in the field of entertainment and education.

8+8 = 16

Contd.

3. (a) What is Tweening and morphing ? What are the major differences in between them ?

(b) Describe Phong illumination model.

8+8 = 16

4. (a) What is Projection ? What are its various types ? Write short notes for each type.

(b) What are basic 3-D transformation operations ? Write transformation matrices for translation scaling and rotation.

8+8 = 16

5. (a) Describe stack based seed filling algorithm.

(b) Describe the midpoint subdivision algorithm for the clipping.

8+8 = 16

6. (a) What is Clipping ? Illustrate Sutherland Cohen line clippling algorithm.

(b) What do you mean by window port and view port ?

8+8 = 16

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2017

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*Answer **five** questions in which*

Q. No. 1 is compulsory.

1. Choose the correct alternative of the following :

   (a) _____ is a large continuous piece of computer memory.

   (i) Bit plane (ii) Frame buffer

   (iii) Tablet (iv) DAC

   (b) In Euclidean geometry exactly one line can be found that passes through :

   (i) One point (ii) Two points

   (iii) n points (iv) Three points

(c) _____ is the amount of variation in the object detail.

(i) Knot

(ii) Fractal dimension

(iii) Bernstein basis

(iv) None of these

(d) The maximum numbers of points that can be displayed without overlap on a CRT is referred to as :

(i) Resolution (ii) Persistence

(iii) Attenuation (iv) None of these

(e) Scaling is a / an _____ transformation.

(i) Non-affine

(ii) Affine

(iii) Both (i) and (ii)

(iv) Neither (i) nor (ii)

(f) When the off-diagonal terms of the 2D transformation are non-zero, the transformation effect is called _____.

(i) Shearing (ii) Reflection

(iii) Rotation (iv) None of these

(g) Vector fonts are also called _____.

(i) Stoke fonts

(ii) Sprite fonts

(iii) Splin fonts

(iv) Digital fonts

(h) In hypermedia, which of the following links are not acceptable ?

(i) Images

(ii) Audio chips

(iii) Animated video

(iv) None of these

2. What do you mean by computer graphics ? Discuss application are as of computer graphics.

3. Briefly outline the working principles of active shutter Technology for 3D viewing.

4. If a triangle ABC is rotated by an angle 30^o, where the triangle has the co-ordinate A (0, 0) B(10, 2) and C(7, 4) then find the co-ordinates of the triangle in its new position.

5. (a) State the Sutherland-Hodgeman polygon clipping algorithm.

(b) Consider a clip polygon defined by A(2, 2), B(2, 6), C(8, 6) and D(8, 2). Find the points $V_1(1, 4)$ and $V_2(4, 4)$ lie inside and outside of the clip polygon, using polygon edge as reference.

6. Define an Orthographic projection. Derive a mathematical model and a transformation matrix for a parallel projection.

7. What is Morphing ? Discuss the challenges in the design of morphing system. Also, discuss, morphing order and how it affects morphing.

8. What do you mean by Tweening ? Write the types of Tweening and the process of Tweening in computer animation.

9. What is Virtual Reality Modeling Language(VRML) in multimedia ? Discuss the various types of virtual reality modeling syntax.

10. Define Multimedia and its types. Describe the various building blocks of multimedia system.