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Total No. of Pages : 03

Total No. of Questions : 14

MCA (Sem.–5)

COMPUTER GRAPHICS

Subject Code : MCA-501

Paper ID: A0521

Time : 3 Hrs. Max. Marks : 75

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A will be compulsory and have 20 questions of 1 mark each.
2. SECTION-B will have 8 short answer type questions of 5 marks each, out of which candidate will have to attempt any 5.
3. SECTION-C will have 5 long answer type questions of 10 marks each, out of which candidate will have to attempt any 3.

SECTION-A

1) Multiple Choice Questions :

a. Identify impact printer from the following

a) Drum Plotter b) Inkjet printer

c) Electrostatic printer d) Dot-matrix printer

b. A major disadvantage of DVST in interactive computer graphics is :

a) Ability to selectively erase part of an image

b) Inability to selectively erase part of image from screen

c) Inability to produce bright picture

d) None

c. Pick out the odd one out : .....

a) LED b) LCD

c) Gas Discharge tube d) Plasma Panel

d. Which algorithm is a faster method for calculating pixel positions?

a) Bresenham's line algorithm b) Mid-point algorithm

c) DDA line algorithm d) All of the above.

e. In Bresenham's line algorithm, if the distances dl < d2 then decision parameter Pk is .....

a) Positive b) Equal c) Negative d) None of these

f. An accurate and efficient raster line-generating algorithm is

a) DDA algorithm b) Mid-point algorithm

c) Bresenham's line algorithm d) All of the above

g. If a line joining any two of its interior points lies not completely inside are called

a) Convex polygon b) Concave polygon

c) Both a) & b) d) None of these

h. The transformation that disturbs the shape of an object are called

a) Reflection b) Shear c) Rotation d) Scaling

i. In Cohen-Sutherland clipping algorithm, if the two out codes have at least one bit in common, then they lie on the same side and trivially

a) Rejected b) Accepted c) Truncated d) Disappeared

j. The graphics method in which one object is transformed into another object are called:

a) Clipping b) Morphing c) Reflection d) Shear

k. Identify impact printer from the following

a) Plotter b) Laser printer

c) Daisy wheel printer d) None of these

Fill in the blanks :

l. The maximum number of points that can be displayed without overlap on a CRT ……

m. Interlaced refresh procedure is allowed in ……..

n. The transformation in which an object is moved from one position to another in circular path around a specified pivot point is called ……..

o. If a point (x,y) is reflected about an axis which is normal to the XY plane and passing through the origin, the reflected point (X,Y) is ……..

p. The process of extracting a portion of a database or a picture inside or outside a specified region are called …….

q. Coordinates of window are known as …….

r. The transformation that produces a parallel mirror image of an object are called ……..

s. A composite transformation matrix can be made by determining the …….. of matrix of the individual transformation.

t. …….. are examples of non-impact printers.

SECTION-B

2) Explain DDA line drawing algorithm. What are the drawbacks of DDA line drawing algorithm?

3) What are the various scanning techniques employed for graphics display? Explain the working principle vector refresh display and raster refresh display with a sketch. What are its advantages and disadvantages?

4) Given a circle having centre at (4, 5) of radius r =12 cm, determine the pixel positions along the circle octant using midpoint algorithm in all quadrants from x = 0.

5) Show that the midpoint decision parameters are the same as those in the Bresenham's line algorithm.

6) Compare DVST and refresh display. List the properties of phosphor used in CRT monitors.

7) Explain why the homogeneous coordinates used for transformation computations in computer graphics?

8) Compare the working principles of the electrostatic printer with that of a laser printer.

9) Prove that the multiplication of transformation matrices for each of the following sequence of operations is commutative:

   a) two successive rotations

   b) two successive translations.

SECTION-C

10) What is geometric transformation? Derive transformation matrix for 2D Transformations, translation, rotation scaling and shearing. Give the use of such transformations.

11) Discuss about parallel and perspective projection in detail.

12) Explain the following: data glove, half toning, ink-jet printers, area filling techniques.

13) What is clipping? How Southerland Hodgeman clipping is performed? Explain in detail.

14) What is ray tracing algorithm for hidden surface removal? Explain mathematically how do we find which planes are visible using ray tracing algorithm.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.