

Roll No.

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 :

- Identify impact printer from the following
 - Drum Plotter
 - Inkjet printer
 - Electrostatic printer
 - Dot-matrix printer
- A major disadvantage of DVST in interactive computer graphics is :
 - Ability to selectively erase part of an image
 - Inability to selectively erase part of image from screen
 - Inability to produce bright picture
 - None
- Pick out the odd one out :
 - LED
 - LCD
 - Gas Discharge tube
 - Plasma Panel
- Which algorithm is a faster method for calculating pixel positions?
 - Bresenham's line algorithm
 - Mid-point algorithm
 - DDA line algorithm
 - All of the above.
- In Bresenham's line algorithm, if the distances $d_1 < d_2$ then decision parameter P_k is
 - Positive
 - Equal
 - Negative
 - 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 Sutherland 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.