

Roll No. ...6161680031

Total No. of Questions : 10] [Total No. of Printed Pages : 7
(1049)

**B.C.A. (CBCS) RUSA Vith Semester
Examination**

4398

COMPUTER GRAPHICS

Paper : BCA-0604

Time : 3 Hours]

[Maximum Marks : 70

Note :- Attempt *six* questions in all. Part A is compulsory.
Attempt any *four* questions, selecting *one* question
each from Part B, C, D and E.

Part-A

(Compulsory)

1. Attempt all questions :

(i) Which of the following is the basic unit of
drawing in a raster scan system ?

(a) Lines

(b) Pixels

(c) Points

(d) Vectors

CH-724

(1)

Turn Over

(ii) Which of the following methods is used to produce color CRT monitors for a random scan system ?

- (a) Beam penetration
- (b) Shadow masking
- (c) Shadow penetration
- (d) Beam masking

(iii) Which of the following is NOT a digital input device ?

- (a) Keyboard
- (b) Optical mouse
- (c) Image scanner
- (d) Voice entry system

(iv) The acronym DDA stands for :

- (a) Digital differential algorithm
- (b) Digital differential analyzer
- (c) Digital difference analyzer
- (d) Differential digital algorithm

(v) Which of the following algorithms should NOT be used for generating ellipse ?

- (a) Direct
- (b) Mid-point
- (c) Bresenham
- (d) Polar domain

(vi) Which of the following transformation is used to change the size of an object ?

- (a) Translation
- (b) Scaling
- (c) Rotation
- (d) Shearing

(vii) The transformation that produces a parallel mirror image of an object are called :

- (a) Rotation
- (b) Reflection
- (c) Translation
- (d) Scaling

- (vii) Which of the following the transformation is used to map the world coordinates onto the screen coordinates ?
- Window-to-viewport
 - Viewport-to-window
 - 2D composite
 - 2D coordinate
- (ix) Which of the following algorithms is NOT used for line clipping ?
- Sutherland-Hodgeman
 - Cohen-Sutherland
 - Liang-Barsky
 - Nicholl-Lee-Nicholl
- (x) Which of the following is a polygon clipping algorithm ?
- Nicholl-Lee-Nicholl
 - Cohen-Sutherland
 - Liang-Barsky
 - Weiler-Atherton
- 1×10=10

2. Attempt the following questions in (25-50) words.

- What is the application of computer graphics in the area of medical science and entertain industry ?
 - Explain the working of Plasma Panel displays.
 - How characters can be generated using BITBLT method ? Give an example.
 - Define shearing. Write the equations and homogeneous matrix representation for shearing.
 - Briefly explain various types of text clipping methods.
- 5×4=20

Part-B

(Unit-I)

10 each

- Give the architecture of raster scan system and differentiate it from a random scan system.
- Explain the following input Devices :
 - Keyboard
 - Joystick
 - Touch Panels
 - Light Pens

Part-C

(Unit-II)

10 each

5. Derive DDA line algorithm for the line with $\Delta x > 0$, $\Delta y > 0$, and $\Delta x > \Delta y$. Generalize it for all line types and trace the algorithm for line with end points (10, 13) to (5, 23).
6. Write the procedural steps for Bresenham circle algorithm and evaluate the raster locations generated by the algorithm for a circle with radius 5.

Part-D

(Unit-III)

10 each

7. Find the 2D transformation $R_{(h,k)}$ that rotates an object by an angle of θ about the fixed point (h, k) . Also find the coordinates of the triangle ABC where $A(0, 0)$, $B(5, 2)$ and $C(2, 3)$ after rotating it by an angle of 45° about point C.
8. Define 2D viewing transformation and derive Window-to-Viewport transformation to map a window of size (x_{wmin}, y_{wmin}) to (x_{wmax}, y_{wmax}) onto the viewport of size with the help of (x_{vmin}, y_{vmin}) to (x_{vmax}, y_{vmax}) .

Part-E

(Unit-IV)

10 each

9. Explain Liang Barsky Line Clipping technique and demonstrate its working by clipping the line segment AB where $A \leftrightarrow (8, 9)$ and $B \leftrightarrow (-4, 3)$ against the window defined from $(-4, -5)$ to $(5, 4)$.

Or

10. What are the various polygon clipping algorithms ? Explain the working of Sutherland-Hodgeman algorithm with the help of suitable example.