

MASTER OF COMPUTER APPLICATION
Fifth Semester (Repeat)
COMPUTER GRAPHICS
(MCA - 21)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

Answer any four from Question no. 2 to 8
Question no. 1 is compulsory.

1. What are the features of inkjet printer? Write down the working principle of a digitizer. With help of a neat diagram, explain the architecture of a raster display. (3+3+4=10)
2. What is computer graphics? Write down five different applications of it. Explain the components of computer graphics along with a diagram. (2+5+3=10)
3. Perform a 45° rotation(2D) of a triangle A(0,0), B(1,1) and C(5,2) (5+5=10)
 - a. About the origin
 - b. About the point (-1,-1)
4. Write a circle generating algorithm. Plot a circle by Bresenham's algorithm whose radius is 4 and center position is (0,0). (10)
5. What are different types of polygons? Explain various approaches used to represent polygons. Explain Seed Fill algorithm in details. (2+4+4=10)
6. (i) How many types of basic transformations available in 2D? Explain each along with their matrix representations.
(ii) What do you mean by homogeneous coordinate system? Explain it. (5+5=10)

7. (i) What do you mean by 3D transformation? How do we represent a point in 3D?
(ii) For the given matrix

$$\begin{pmatrix} 2 & 0 & 1 & 0 \\ 1 & 3 & 0 & 0 \\ 4 & 0 & 1 & 0 \\ 0 & 3 & 6 & 1 \end{pmatrix}$$

First apply a rotation of 45° about the Y-axis followed by a rotation of 45° about the X-axis.

(1+2+7=10)

8. (i) What do you mean by Projection? Explain different categories of projection.
(ii) Explain Painter's algorithm in details.

(1+4+5=10)

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Duration: 20 minutes

Marks – 20

(PART A - Objective Type)

I. Choose the correct answer:

1×10=10

1. Point out which hidden surface removal algorithm does not employ image space approach?
 - a. Back face removal
 - b. Z buffer method
 - c. Scan line method
 - d. Depth sort method

2. Major components of CRT are
 - a. Electron Gun
 - b. Phosphorous coated screen
 - c. Control electrodes
 - d. All of the above

3. Back face is an example of
 - a. Object space method
 - b. Image SP method
 - c. Combination of both
 - d. None

4. Which of the following device has a relative origin?
 - a. Joystick
 - b. Trackball
 - c. Mouse
 - d. None

5. The phenomena of continuous glow of beam on the screen even after it is removed is known as
- Fluorescence
 - Persistence
 - Phosphorescence
 - Incidence
6. In Cohen Sutherland line clipping Algorithm, a line is already clipped if the _____.
- Codes of the endpoints are same.
 - Logical AND of the endpoint code is not 0000.
 - Logical OR of the endpoint code is 0000.
 - A & B
7. The sub categories of orthographic projection are
- Cavalier, cabinet, isometric
 - Cavalier, cabinet
 - Isometric, diametric, trimetric
 - None of the above
8. Shadow mask method is usually used in
- LCD
 - Raster Scan Display
 - Random Scan Display
 - DVST
9. The region code of a point is 1001 the point is in the _____ region of the window.
- Top right
 - Top left
 - Bottom left
 - Bottom right

10. (2, 4) is a point on a circle that has center at the origin. Which of the following points are /is also on the circle?

- a. (2, -4)
- b. (-2, 4)
- c. (-4, -2)
- d. All of the above

II. Write true or false:

1×5=5

- 1. Control electrode is used to regulate the flow of electrons in CRT.
- 2. Examples of presentation graphics are bar charts and line graphs.
- 3. Seed pixel is considered in case of a mid-point circle algorithm.
- 4. Coordinates of the viewport are known as world coordinates.
- 5. Every display file contains some contiguous blocks known as segments.

III. Fill in the blanks:

1×5=5

- 1.is the ratio horizontal point to vertical points necessary to produce equal length lines in both directions.
- 2. The transformation in which the dimension of an object is changed relative to a specified fixed point is called.....
- 3. The rectangle portion of the interface window that defines where the image will actually appear are called.....
- 4. The..... algorithm divides a 2D space into 9 regions of which only the middle part is visible.
- 5. Oblique projection with an angle of 45 degree to the horizontal plane is called as