



Name :

Roll No. :

Invigilator's Signature :

CS/M.TECH(IT)/SEM-3/ITM-302/2012-13

2012

COMPUTER GRAPHICS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

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

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$
 - i) Which of the following is a type of any projection ?
 - a) Perpendicular
 - b) View
 - c) Oblique
 - d) Orthogonal.
 - ii) In mid-point circle drawing algorithm, if (x, y) is the current pixel position and decision of parameter $P_k > 0$ then next pixel position is
 - a) $(x, y + 1)$
 - b) $(x + 1, y)$
 - c) $(x + 1, y + 1)$
 - d) $(x + 1, y - 1)$.
 - iii) Which of the following methods is used as an area filling method ?
 - a) Cohen-Sutherland line clipping
 - b) Sutherland-Hodegman polygon clipping
 - c) Scan line polygon fill
 - d) DDA.



- iv) The matrix representation of reflection with respect to $y = -x$ line is

a) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

b) $\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

c) $\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

d) $\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$.

- v) Hue of a color is related to its

- a) luminance b) saturation
c) incandescence d) wavelength.

- vi) Bresenham's algorithm seeks to select the optimum raster location that represents a

- a) straight line b) curve line
c) polygon d) none of these.

- vii) z-buffer algorithm is used for


- a) frame buffer removal b) hidden line removal
c) rendering d) animation.

- viii) acts as anode in CRT.

- a) The phosphorous coating
b) The glass panel
c) The deflectors
d) None of these.

- ix) A line with end point codes as 0100 and 0000 is

- a) partially visible b) completely visible
c) trivially visible d) completely invisible.

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(Short Answer Type Questions)

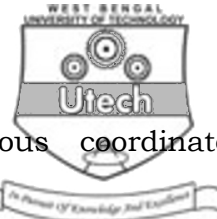
Answer any *three* of the following $3 \times 5 = 15$

2. What are the differences between raster and vector scan techniques ?
3. How does Z-buffer algorithm derives which surfaces are hidden ?
4. Write down Boundary Fill and Flood Fill Algorithms.
5. Explain working principle of a Monochrome Cathode Ray Tube based monitor.
6. What is Vanishing point ?

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7.
 - a) Write down the Bresenham's line drawing algorithm with proper explanation. Explain how Bresenham's line drawing algorithm advantageous over DDA algorithm.
 - b) What do you mean by projection ? Explain about different types of projection. 8 + 3 + 4
8.
 - a) Write down the Midpoint Ellipse drawing algorithm.
 - b) Using Mid-point Circle Drawing Algorithm, find the pixels in first octant of a circle with radius $r = 10$ having centre at origin. 8 + 7



9. a) Explain the necessity of homogeneous coordinate system in composite transformation. 3 + 7 + 5
- b) Reflect a triangle ABC where $A (10,10)$, $B (20,20)$ and $C (10,20)$ with respect to a line whose equation is $y = x - 1$. Find out the coordinates of the reflected triangle and illustrate the situation properly.
- c) Scale the triangle with axis points at $(100, 100)$, $(100, 200)$ and $(200, 100)$ of half of its present size with respect to the point $(100, 100)$. 3 + 7 + 5
10. Write short notes on any *three* of the following : 3 × 5
- a) General parallel-projection transformation
- b) Bezier curve
- c) Hidden surface
- d) Anti-aliasing.
11. a) What is clipping ?
- b) Describe window port to view port transformation.
- c) Explain Liang-Barsky Line Clipping Algorithm with proper illustration and example. 3 + 4 + 8

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