GURU NANAK INSTITUTE OF TECHNOLOGY

An Autonomous Institute under MAKAUT

2020-2021

COMPUTER GRAPHICS (Backlog)

CS501

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)

Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

			Marks	CO No.
1.	i)	In Bresenham's circle generation algorithm, if (x, y) is the current pixel position then the y value of the next pixel position is a) y or y + 1 b) y alone c) y + 1 or y – 1 d) y or y – 1.	01	CO1
	ii)	A 24-bit plane color frame buffer with three 10-bit wide color look-up table can have _____numbers of possible colors. a) 2^{24} b) 2^{8} c) 2^{48} d) 2^{30}	01	CO2
	iii)	In the Cohen-Sutherland line clipping algorithm, if the codes of the two points P & Q are 0101 & 0001 then the line segment joining the points P & Q will be the clipping window a) totally outside b) partially outside c) totally inside d) None of these.	01	CO1
	iv)	The slop of the Bezier curve at the starting of the curve is controlled by a) First control b) First two control points c) First three control points d) All four control points.	01	CO1
	v)	The video memory that is used to hold the image displayed on screen is known as a) Display processor b) LUT c) Frame buffer d) Display file.	01	CO2
	vi)	_____ is the rigid body transformation that moves object without deformation a) Translation b) Scaling c) Rotation d) Shearing	01	CO1
	vii)	Graphics with limited features is known as a) Active graphics b) Passive graphics c) Grayscale image d) None of these	01	CO1

	viii)	Which technique of color CRT is used for production of realistic image a) Shadow mask method b) Beam penetration method c) Both A and B d) None of these	01	CO3
	ix)	Fractals deal with curves that are? a) Regularly Irregular b) Irregularly Irregular c) Regularly Regular d) d) Irregularly Regular	01	CO3
	x)	The method which used either delta x or delta y, whichever is larger, is chosen as one raster unit to draw the line this algorithm is called? a) DDA Line Algorithm b) Midpoint Line Algorithm c) Bresenham`s Line Algorithm d) d) Generalized Bresenham`s Algorithm	01	CO3
	1(xi)	The midpoint circle drawing algorithm also uses the __of the circle to generate? a) two-way symmetry b) four-way symmetry c) both (a) and (b) d) eight-way symmetry	01	CO1
	xii)	The process of selecting and viewing the picture with different views is called_____ a) Windowing b) Clipping c) both (a) and (b) d) projecting	01	CO2

GROUP – B
(Short Answer Type Questions)
(Answer any *three* of the following) **3 x 5 = 15**

			Marks	CO No.
2	i)	What is resolution and aspect ratio of an image?	2	CO2
	ii)	Suppose an RGB raster system is to be designed using an 8inch X 8inch screen with a resolution of 100 pixels per inch in each direction. if we want to store 6 bits per pixel in the frame buffer , how much storage in bytes do we need for the frame buffer? Also find out the aspect ratio of the system.	3	CO1
3.	i)	What is seed fill algorithm?	2	CO3
	ii)	How does seed fill differ from scan line algorithm?	3	CO4
4.		Develop general form of 3D rotation about x -axis and about y -axis.	5	CO1
5	i)	Why are hidden surface algorithms needed?	1	CO5
	ii)	What is the maximum number of object that can be handled by Z-buffer algorithm?	2	CO2
	iii)	Why is it easier to locate hidden surfaces when parallel projection is used?	2	
6.		Derive mid-point circle drawing algorithm.	5	CO4

GROUP – C
(Long Answer Type Questions)
(Answer any *three* of the following) **3 x 15 = 45**

			Marks	CO No.
7.	i)	Derive the DDA Line Drawing algorithm.	6	CO1
	ii)	Digitize a line from (10, 12) to (20, 18) using Bresenham's Line Drawing Algorithm.	5	CO3
	iii)	Differentiate between raster and random scan.	4	CO5
8.	i)	Explain Cohen-Sutherland line clipping algorithm.	5	CO3
	ii)	What are the advantage and disadvantage of it?	4	CO5

	iii)	Use Cohen-Sutherland algorithm to clip a line P1(70,20) and P2(100,10) against a window with lower left corner(50,10) and upper right corner (80,40).	6	CO1
9.	i)	What are Flood fill and Boundary fill algorithm?	3	CO5
	ii)	Write down the function of 8-connected flood fill process.	6	CO3
	iii)	Explain the differences between boundary fill and flood fill Algorithm.	2	CO4
	iv)	Distinguish Bezier curve and B-Spline curve.	4	CO4
10.	i)	Derive the transformation matrix for the 2D rotation about an arbitrary point.	5	CO1
	ii)	Magnify the triangle with vertices A(1,1),B(3,2) and C(7,3)to twice its size, while keeping C(7,3) fixed.	5	CO1
	iii)	What do you mean by hidden surface removal?	3	CO5
	iv)	Why is a homogeneous co-ordinate system needed in transformation matrix?	2	CO2
11.		Write short notes on *any three* of the following:	3×5=15	CO4
	i)	3D Rotation	5	CO3
	ii)	RGB & CMYK Color Model	5	CO4
	iii)	Anti-aliasing	5	CO2
	iv)	Z Buffer Algorithm	5	CO4
	v)	Active and Passive Graphics Devices	5	CO4