B.E.Sixth Semester (Computer Technology) (C.B.S.)

Computer Graphics

P. Pages : 2 **NKT/KS/17/7401**

Time : Three Hours * 0 6 7 3 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Differentiate between Random scan and Raster Scan. **6**

b) Explain Graphics primitives in detail. **7**

OR

2. a) What are the different applications of computer graphics. **6**

b) Explain video display controller. **7**

3. a) Generate a line $y = 2x + 10$ using Bresenham's line generation algorithm. What is the significance of error term. **7**

b) Construct a circle of radius 5 and center (-2, -3) in third quadrant anticlockwise direction. **7**

OR

4. a) A polygon is define by the vertices A(1, 4), B(4, 8), C(6, 1), D(9, 4) respectively. Fill the polygon using edge flag Algorithm. **7**

b) Fill the polygon define by vertices A(1, 1), B(4, 1) C(4, 5), D(1, 5). The interior hole is define by $P_1(2, 2)$, $P_2(3, 2)$, $P_3(3, 4)$, $P_4(2, 4)$. Fill the polygon using simple seed fill Algorithm. The seed pixel is at (2, 4). **7**

5. a) What are the features of OpenGL ? Explain them in brief ? **6**

b) Explain with the help of block diagram the processing of OpenGL pipeline. **7**

OR

6. a) Write a program to draw a line in OpenGL ? **6**

b) What is the use of evaluators in OpenGL ? Explain in brief. **7**

7.	a)	Consider a window having co-ordinates A(1, 1), B(-1, 1), C(-1, -1) & D(1, -1). Clip line using Sutherland Cohen Algorithm from $P_1(-3/2, 1/6)$ to $P_2(1/2, 3/2)$.	**8**
	b)	Clip a line define by the end point $P_1(-1, 1)$, $P_2(9, 3)$ against the rectangular clipping window define by vertices A(0, 0), B(8, 0), C(8, 4) & D(0, 4) using cyrus-beck algorithm.	**6**

OR

8.	a)	Reflect a figure define by the vertices A(-1, 0), B(0, -2), C(1, 0), D(0, 2) about y = x+2 axis.	**7**
	b)	A triangle define by $P_1(0, 0)$, $P_2(2, 0)$ & $P_3(3, 2)$ is enlarge twice in x-direction and thrice in y-direction. The enlarge triangle is reduced 1/3 in x-direction. Find out the combined transformation.	**7**
9.	a)	Explain viewing transformation ? Differentiate between window and viewport.	**7**
	b)	Write a short note on parallel projection.	**6**

OR

10.		Explain painters and Warnock's algorithm for hidden surface removal.	**13**
11.	a)	Explain different types of shading in detail.	**5**
	b)	Write a short note on polygon mesh.	**5**
	c)	Write short note on quadratic surface.	**3**

OR

12.	a)	Write a short note on B-Spline curve.	**7**
	b)	Explain basic ray tracing algorithm.	**6**

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