

**NTK/KW/15-7451**

**Fifth Semester B. E. (CE) (C.B.S.)  
Examination**

**COMPUTER GRAPHICS**

Time : Three Hours ]

[ Max. Marks : 80

- N. B. : (1) Due credit will be given to neatness and adequate dimensions.  
(2) Assume suitable data wherever necessary.  
(3) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Explain the various characteristics of line. 6  
(b) Implement the DDA algorithm to draw a line from (0, 0) to (8, 8) 6  
(c) Define Refresh Rate. 2

**OR**

2. (a) Develop an algorithm to generate a circular arc in first quadrant in clockwise direction with the centre as origin using Bresenham's circle generation algorithm. Draw a circle with radius = 8 on the graph paper. 8  
(b) What is aliasing in Computer Graphics ? Explain in detail about various anti-aliasing technique. 6
3. (a) Fill the polygon defined by the vertices A(3,2), B(8,2), C(8,5), D(6,8) and E(3,5) using Fence Fill Algorithm. 7

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Contd.

- (b) Explain scan conversion in detail. 6

**OR**

4. (a) Explain scan line seed fill algorithm in detail with a suitable example. 8  
(b) Write a note on display file structure. State and explain benefits of segmenting a display file. 5
5. (a) Clip a line from  $P_1(-3/2, 1/6)$  to  $P_2(1/2, 3/2)$  in a clipping window defined by vertices  $A(-1, -1)$ ,  $B(1, -1)$ ,  $C(1, 1)$  and  $D(-1, 1)$  by using Sutherland cohen algorithm. 7  
(b) Explain segment table in detail. 4  
(c) What is windowing ? 2

**OR**

6. (a) Clip a line from  $P_1(1,8)$  to  $P_2(8,2)$  about a window defined by co-ordinates  $A(3,3)$ ,  $B(8,5)$ ,  $C(6,8)$  and  $D(1,6)$  using Cyrus Beck Algorithm. 8  
(b) Explain viewing transformation and obtain the matrix. 5
7. (a) Obtain the perspective transformation matrix. Also derive the matrix in terms of 'd', the distance of center of projection from viewing plane. 7  
(b) Compare Isometric and parallel projections. 6

**OR**

8. (a) Derive a rotation transformation about an arbitrary axis in 3.D. 7  
(b) Obtain the perspective and parallel projection matrices. 6
9. (a) Find equation of Bezier curve which passes through points (0,0) and (-2,1) is controlled through points (7,5) and (2,0). 7  
(b) Explain Surface Rendering methods. 6

**OR**

10. (a) State the basic properties of Bezier Bernstein approximation. 5  
(b) Explain B-spline curve in detail. 5  
(c) Give the advantages and disadvantages of phong shading. 3
11. (a) Explain CIF chromaticity Diagram. 6  
(b) Difference between Additive and Subtractive color models. 5  
(c) What are the various characteristics of Light ? 3

**OR**

12. (a) Explain the basic color models and list all the color models. 6  
(b) Explain the various types of Animation. 4  
(c) Give the 12 principles of Animation. 4