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Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Seventh Semester B.Tech Degree (S, FE) Examination January 2023 (2015 Scheme)

Course Code: CS401
Course Name: COMPUTER GRAPHICS

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 4 marks.   Marks

1	Differences between random scan displays and raster scan displays.	(4)
2	Write the flood fill algorithm to fill a polygon.	(4)
3	Describe the transformation M_L that reflects an object about a line L	(4)
4	Scale the triangle PQR with P (0, 0), Q (1, 1) and R (5, 2) to twice its size while keeping R (5, 2) fixed.	(4)
5	How does Cohen Sutherland algorithm determine whether a line is visible, invisible or a candidate for clipping based on the region codes assigned to the end points of the line?	(4)
6	Describe the steps involved in general pivot point scaling in 2D object.	(4)
7	Distinguish between parallel and perspective projections.	(4)
8	Is there any point at which a set of projected parallel lines appears to converge? Justify your answer.	(4)
9	Describe the basic concepts of sampling and quantization with a neat sketch in image processing.	(4)
10	What is Robert edge detection technique in digital image processing?	(4)

PART B
Answer any two full questions, each carries 9 marks.

11	a)	Explain the working principle of refresh CRT with neat diagram.	(5)
	b)	Explain the architecture of LCD.	(4)
12	a)	Draw the line segment from pixel coordinate (1, 1) to (8, 5) using Bresenham's line drawing algorithm.	(5)
	b)	Write the steps of midpoint circle drawing algorithm.	(4)
13	a)	Explain the working of Joysticks.	(4)
	b)	Write the scan line algorithm for filling a polygon.	(5)

PART C
Answer any two full questions, each carries 9 marks.

14   Use Cohen Sutherland algorithm to clip line P1(70,20) and P2(100,10) against a   (9)
      window lower left hand corner (50,10) and upper right hand corner(80,40).

15   Explain the two different polygon clipping algorithm with illustrations.   (9)

16   A clipping window ABCD is specified as A(0,0), B(40,0), C(40,40) and   (9)
      D(0,40).Using Midpoint Subdivision algorithm , find the visible portion , if any
      of the line segment joining the points P(-10,20) and Q(50,10).

PART D
Answer any two full questions, each carries 12 marks.

17 a) Derive the transformation matrix of Perspective projection.   (8)

    b) Describe in detail the depth buffer visible surface detection technique.   (4)

18 a) Explain the fundamental steps in Digital Image Processing with a neat diagram?   (8)

    b) Describe histogram equalization and discuss the role of histogram equalization   (4)
        in a digital image.

19 a) Explain the Sobel edge detector in detail.   (4)

    b) Describe about the depth-sorting method to display the visible surfaces of any   (8)
        given object with plane faces. Also explain the tests to identify overlapping
        surfaces.

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