

(3 Hours)

[Total Marks: 80]

- N.B.:** 1) Question No.1 is **compulsory**.
2) Attempt any **three** from the remaining **five** questions.

Q. 1. Attempt **any four** :- 20

- (a) Different between Raster-Scan System and Random-Scan Systems
(b) Explain even-odd test to determine whether point is inside or outside of a polygon
(c) What will be the effect of scaling factor $S_x = 1/2$ and $S_y = 1/3$ on a given triangle ABC? Whose coordinate are A[4, 1], B[5, 2], C[4, 3].
(d) Explain the digital image representation?
(e) What is importance of homogeneous coordinates?

Q. 2. (a) What is transformation? Develop a 2D rotation and scaling transformation matrices with respect to a fixed point P(X_p , Y_p). (10)
(b) What is filling algorithm? Explain the Boundary fill algorithms and Flood fill algorithms with pseudo code. (10)

Q. 3. (a) Equalize the given histogram (10)

Grey Level	0	1	2	3	4	5	6	7
No. of Pixels	0	50	0	50	0	50	0	50

(b) Discuss the types of projections in computer graphics. (10)

Q. 4. (a) What is line clipping? Use Liang - Barsky line clipping algorithm to find the visible portion of line P1(-10, 50) to P2(30, 80) against a window ($X_{wmin} = -3$, $Y_{wmin} = 10$) and ($X_{wmax} = 20$, $Y_{wmax} = 60$). (10)

(b) What is fractal? What are different types of fractals? Explain Koch Curves. (10)

Q. 5. (a) What is rasterization? Derive and write DDA line drawing algorithm. (10)

(b) For the following eight bit image perform the following operations. (10)
1. Threshold, $T=150$
2. Image negative

120	135	215	220	125
135	20	187	50	80

250	115	55	120	45
30	180	200	46	20
60	119	120	255	135

- Q. 6. (a) What are the fundamental steps in digital Image Processing? (10)
- (b) Write an algorithm for a midpoint circle generation and plot a circle centered at (10, 5) having a radius of 15 units. (10)
