

[Time: 3 Hours]
[Marks:80]

Please check whether you have got the right question paper.

- N.B: (1) Question No. 1 is **Compulsory**.
 (2) Attempt any **three** from **2 to 6** from remaining **five** Questions.

1. (a) Write the types of projection and differentiate between parallel and perspective projection. **10**
 (b) Write the Bresenham's Line Drawing algorithm and Rasterize the line between the endpoints (4, 7) and (9, 11). **10**
2. (a) What do you mean by viewing pipeline? Explain window to viewport transformation in brief. **10**
 (b) Define the different types of 2D transformations with matrix representation. **10**
3. (a) What are fractals? Write the types of fractals. **10**
 (b) Apply the scaling transformation on triangle A(10,10), B(17,8) and C(13,15) by keeping C fixed. **10**
4. (a) Write the meaning and matrix representation of 3D transformations - translation, rotation, scaling, reflection and shear. **10**
 (b) Explain the reflection about arbitrary axis in 3D with matrices. **10**
5. (a) Write the fundamental steps in Digital Image processing in short. **10**
 (b) Apply the following transformations on the following 3 BPP image- **10**
 - a) Image negative
 - b) Gray-level slicing with background **when r1=3 and r2 6.**
 - c) Thresholding with **Threshold value=4.**

2	1	0	7	5
4	2	3	1	2
7	6	2	1	6
2	4	5	6	7
2	3	4	5	1

6. Write a short note on (**ANY FOUR**) **20**
 - (i) Cubic Bezier Curve
 - (ii) Non-Zero winding Number Rule
 - (iii) Sampling & Quantization
 - (iv) Graphics System
 - (v) Homogeneous Coordinates
