

- (2) Attempt any **four** questions out of remaining **six** questions.
 (3) Assume **suitable** data and draw **diagram** if **necessary**.

1. (a) Write DDA algorithm to draw a line. Also explain the basic transformations in Computer Graphics. **10**
 (b) Explain following terms :- **10**
 (i) Image Processing and Graphics
 (ii) Brightness Adaptation
 (iii) Non-uniform Sampling
 (iv) Isopreference Curves
 (v) Fourier Descriptor.

2. (a) Show that 2D-DFT of an image can be computed by row and column passes with 1D-DFT algorithm. **10**
 (b) Explain DCT and it's applications. Apply DCT on the given image. **10**

2	0	1	0
1	1	0	1
1	0	0	1
2	1	2	3

3. (a) What is an edge. Give typical edge profiles and convolution masks for Roberts, Laplace and Prewitt edge detectors. **10**
 (b) Explain following methods of image segmentation by giving appropriate illustrations :- **10**
 (i) Region growing
 (ii) Splitting and Merging.

What is the importance of image segmentation in satellite images and biomedical images.

4. (a) Explain in detail the effects of opening and closing operations. How does the output of opening and closing changes as a function of the shape of structuring element ? **10**
 Consider suitable image for explanation.
 (b) Explain Hough-Transform and its applications in detection of shapes. **10**

5. (a) Explain Filtering in Spatial domain. **10**
 (b) A 64 x 64 image represented by 8 bits/pixel has following gray level distribution. **10**

Gray level	0	1	2	3	4	5	6	7
No. of pixels	120	80	280	420	650	1060	800	686

Perform Histogram Equalization and show plots of original and equalized image.

6. (a) What are different types of redundancies in digital images and give methods to remove those redundancies. **10**
 (b) Explain the following with example and its applications :- **10**
 (i) Chain Code
 (ii) Moments.

7. Write short note on :- **20**
 (a) Wavelet Transform
 (b) Edge linking and boundary detection via graph theoretic technique
 (c) Image compression standards
 (d) Homomorphic filters.