

**M.Tech in Printing Engineering and Graphic Communication, 1st Year 1st
Sem Examination – 2025 (Old)**

Subject: Digital Image Processing and Analysis Time: 3Hr. Full Marks: 100

Answer any 4 questions

1. a) Briefly write on sampling and quantization of signals. 5

b) Consider following image and show the compression that can be achieved using LZW algorithm. 20

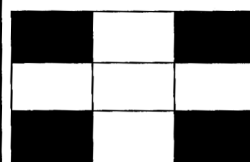
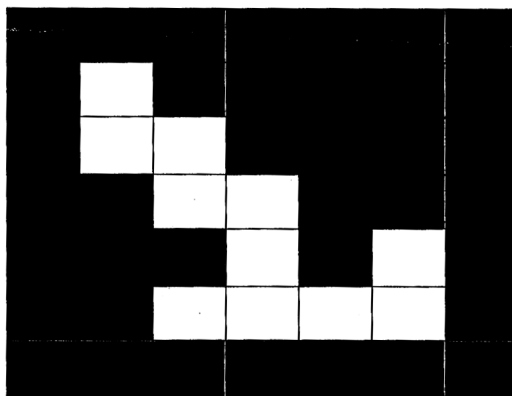
10	10	120	120
10	10	120	120
10	10	120	120
10	10	120	100

2. a) Briefly describe the concept of frequency domain high-pass filtering. 5

b) Perform contrast enhancement on the following image using histogram equalization. 20

100	100	100	20	92	92	92	20
100	92	92	92	100	100	100	92
15	100	70	70	15	15	92	92
92	92	15	100	70	100	100	60
100	15	70	100	100	100	15	65
100	60	70	100	15	92	92	15
100	100	100	100	100	100	15	20
20	15	100	100	100	100	100	20

3. a) Explain the opening and closing operations of mathematical morphology and illustrate them using following image and structuring element. 20



Structuring element

b) What is bit-plane slicing?

5

4. a) Briefly discuss three types of redundancy in compression algorithm.

5

b) Discuss the steps of split and merge algorithm for segmentation and show the result of application of the algorithm on following image.

20

50	50	50	20	15	15	15	20
50	15	100	100	100	50	50	15
15	50	70	70	200	200	15	15
15	15	15	100	100	200	50	60
50	15	100	100	150	210	210	65
50	60	70	250	150	150	210	15
50	50	50	250	150	100	100	20
20	15	50	50	50	50	100	20

5. a) Perform any 3 smoothing filtering on the following image and note down your observations. 15

50	150	200
50	150	200
50	150	200

b) Discuss the principle of GLCM using above image.

10

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