



**Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026**  
**Digital Image Processing**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

**Module-1**

- 1 a. What is Digital Imaging Processing? Explain the fundamental steps in digital image processing. (10 Marks)
- b. With neat block diagram explain the fields that use digital image processing. (10 Marks)

**OR**

- 2 a. Explain the process of image acquisition using sensors. (10 Marks)
- b. With necessary diagram write short notes on :  
 i) Brightness adaptation  
 ii) Simultaneous contrast. (10 Marks)

**Module-2**

- 3 a. Explain the process of sampling and quantization with relevant diagram. (08 Marks)
- b. For  $V = \{2, 3, 4\}$  compute the lengths of shortest 4, 8, m paths between p and q in the following image.

	3	4	1	2	0
	0	1	0	4	2 (q)
	2	2	3	1	4
(p)	3	0	4	2	1
	1	2	0	3	4

Fig.Q3(b) (08 Marks)

- c. Explain the commonly used distance measures between pixels with relevant equations. (04 Marks)

**OR**

- 4 a. Explain any four points processing with respect to spatial domain to enhance the images. (10 Marks)
- b. For the given  $4 \times 4$  image having grey scales between  $[0, 9]$ , get histogram equalized image and draw the histogram of image before and after equalization.

2	3	3	2
4	2	4	3
3	2	3	5
2	4	2	4

Fig.Q4(b) (10 Marks)

**Module-3**

- 5 a. List and explain any three properties of 2D discrete Fourier transform with relevant equations. (10 Marks)
- b. Explain the types of image smoothing filters in frequency domain. (10 Marks)

**OR**

- 6 a. With a neat block diagram explain the homomorphic filtering system to improve the appearance of an image. (10 Marks)
- b. Write short notes on the following image sharpening filters in frequency domain.  
 i) Ideal high pass filters  
 ii) Gaussian high pass filter  
 iii) Butterworth high pass filter  
 iv) Laplacian high pass filter (10 Marks)

**Module-4**

- 7 a. Explain the model of image restoration/degradation process with neat block diagram. (10 Marks)
- b. Discuss various noise models with respect to image restoration process. (10 Marks)

**OR**

- 8 a. Explain the periodic noise reduction using frequency domain filtering. (10 Marks)
- b. Explain the minimum mean square error filtering technique to restore the image with relevant equations. (10 Marks)

**Module-5**

- 9 a. Explain the opening and closing operations with respect to morphological image processing with neat figures. (10 Marks)
- b. Write short notes on :  
 i) Erosion  
 ii) Dilation. (10 Marks)

**OR**

- 10 a. Write a note on pseudo colour image processing and explain the intensity level slicing method of pseudo colour image processing. (10 Marks)
- b. Explain the following colour models with respect to colour image processing  
 i) RGB ii) HSI. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.