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

Max. Marks: 100

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

Module-1

- 1 a. With a neat diagram, explain the fundamental steps in digital image processing. (10 Marks)
 b. Explain the components of an image processing system with a suitable block diagram. (10 Marks)

OR

- 2 a. Explain the concept of sampling and quantization with necessary diagrams. (10 Marks)
 b. Consider the image segment shown in Fig.Q2(b). i) Let $v = \{0, 1\}$ and compute the length of shortest 4, 8 and M-path between p and q ii) Repeat for $V = \{1, 2\}$.

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

Fig.Q2(b)

(10 Marks)

Module-2

- 3 a. Explain the following gray level transformations with a neat graph.
 i) Log transformation ii) Power law transformations. (10 Marks)
 b. Explain the different spatial filters used for image smoothing. (10 Marks)

OR

- 4 a. Obtain the equation for one dimensional discrete Fourier transform and its inverse from the continuous transform of sampled function of one variable. (10 Marks)
 b. Explain the steps involved in Image filtering in frequency domain. (10 Marks)

Module-3

- 5 a. Explain the different noise probability density functions in image restoration. (10 Marks)
 b. Explain Band reject filters and Bandpass filters. (10 Marks)

OR

- 6 a. Explain Inverse filtering, with example. (10 Marks)
 b. Explain Wiener filtering. (10 Marks)

Module-4

- 7 a. Explain HSI color model. Write the conversion of color from RGB to HSI and HSI to RGB. (10 Marks)
 b. Explain Gray level to color transformations, with neat diagram. (10 Marks)

OR

- 8 a. Explain Erosion and dilation with example. (06 Marks)
 b. Explain Opening and Closing. (08 Marks)
 c. Explain Hit – or – Miss transformation. (06 Marks)

Module-5

- 9 a. Discuss the procedure of obtaining the segmented regions using split and merge strategy, with example. (10 Marks)
 b. Explain the technique for detecting three basic types of gray level discontinuities in a digital image. (10 Marks)

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OR

- 10 a. Describe the procedure of detecting lines using Hough transform. (10 Marks)
 b. Discuss image segmentation using Thresholding in detail. (10 Marks)

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.