CBCS SCHEME

USN | | | | | | | | | | |

21CS732

ACHARYA INSTITUTE OF TECHNOLOGY MCA Library Date ....

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.*

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.

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)**

OR

10 a. Describe the procedure of detecting lines using though transform. **(10 Marks)**

b. Discuss image segmentation using Thresholding in detail. **(10 Marks)**

* * * * *