CBCS SCHEME

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

15MT754

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
Digital Image Processing

Time: 3 hrs. Max. Marks: 80

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 block diagram, explain the fundamental steps in digital image processing. **(10 Marks)**

b. Discuss the applications of image processing in various fields. **(06 Marks)**

OR

2 a. With a neat block diagram, explain components of DIP. **(08 Marks)**

b. Explain the structure of human eye and image formation in the eye. **(08 Marks)**

Module-2

3 a. Explain the image acquisition using sensor strips and image acquisition using sensor arrays. **(08 Marks)**

b. Briefly explain the advantages of m – adjacency. **(08 Marks)**

OR

4 a. Write a 4 – adjacency , 8 – adjacency , m – adjacency for adjacency V = {1). **(06 Marks)**

b. Briefly explain the applications of Zooming and Shrinking digital images. **(06 Marks)**

c. Write the 3 different neighbors of a pixel. **(04 Marks)**

Module-3

5 a. Explain the two dimensional discrete Fourier transform and its properties. **(08 Marks)**

b. Explain the Discrete Cosine transform and its properties. **(08 Marks)**

OR

6 a. Generate Haar transform for N = 8. **(08 Marks)**

b. Explain Hadamard transform and its properties. **(08 Marks)**

Module-4

7 a. Explain Image enhancement in spatial domain. **(08 Marks)**

b. Explain Image negative , Log transformation and Power law transformation with respect to gray level transformation.. **(08 Marks)**

OR

8 a. Write the functions for the below smoothing frequency domain filters :
i) Ideal low pass filter.
ii) Butterworth low pass filter. **(08 Marks)**

b. With a neat block diagram, explain Homomorphic filtering approach for Image enhancement. **(08 Marks)**

Module-5

9 a. Explain the following with respect to noise models :
i) Gaussian Noise ii) Rayleigh Noise iii) Impulse Noise iv) Uniform Noise. **(08 Marks)**

b. Derive an equation for Linear Position Invariant Degradations. **(08 Marks)**

OR

10 a. With the necessary diagram, explain the HSI color model. **(10 Marks)**

b. Explain the processing basics of full color image processing. **(06 Marks)**

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