

D6BMC2201

Reg. No.....

Name:

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2025

COMPUTER SCIENCE AND MATHEMATICS (DOUBLE MAIN)

GDCS6B10T: IMAGE PROCESSING

Time: 2 Hours

Maximum: 60 Marks

**SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 marks)**

1. What is 2D orthogonal transform? List its importance.
2. Differentiate between 4-connectivity and 8-connectivity of pixels.
3. Explain the role of the human eye in visual perception.
4. Define the terms convolution and correlation.
5. List out different types of mean filter.
6. Explain the significance of the Shifted Fourier Transform in image processing.
7. What is Band-Pass filters in frequency domain filtering?
8. Describe the concept of histogram equalization.
9. Compare Image Enhancement and image restoration?
10. List out the applications of DCT.
11. Differentiate inverse filter and pseudo inverse filter.
12. How does Arithmetic Coding achieve better compression than Huffman Coding?

**SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 marks)**

13. Compare and contrast the RGB, CMY, and HIS colour models in terms of their advantages, applications, and limitations.
14. Write short notes on neighbours of a pixel.
15. Describe the Laplacian filter and its role in image sharpening.
16. Explain the image degradation and restoration process. How does it help improve image quality?
17. Explain run length coding with a suitable example.
18. What are the key properties of the DCT that make it useful for image processing applications?
19. Enumerate the steps involved in constructing a Huffman tree.

SECTION C: Answer any *one* question. The question carries *ten* marks.

20. Compare the Hadamard Transform and Haar Transform. Discuss their computational efficiency and areas of application.
21. Draw the block diagram and explain homomorphic filtering in detail.

(1 x 10 = 10 Marks)