QP CODE: 25020854

25020854

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE / MERCY CHANCE EXAMINATIONS, FEBRUARY 2025

Sixth Semester

B.Sc Electronics Model III

CHOICE BASED CORE COURSE - EL6CBT01 - INTRODUCTION TO DIGITAL IMAGE PROCESSING

2017 Admission Onwards

F019BA5F

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What is a digital image?
2. What are rods and cones?
3. Give the relevance of Gamma correction.
4. What are the arithmetic/logic operations on an image?
5. What is the mathematical operation involved in spatial filtering?
6. What is the basic principle involved in frequency domain filtering?
7. State the equation for the homomorphic filter transfer function.
8. How degradation function can be estimated by observation?
9. What is a Geometric mean filter?
10. Give the conversion formula for HSI to RGB.
11. What is lossy and loss-less compression?
12. Mention the basic idea behind JPEG compression standard.

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Describe the components of an image processing system.

14. Explain the various histogram processing techniques.

15. Explain the different Laplacian masks associated with high pass filtering.

16. Explain the basic properties of 2D-DFT.

17. Explain the design of a high pass Butterworth image filter.

18. What do you mean by image degradation? Explain image degradation model.

19. Explain the idea behind inverse filtering.

20. Explain how pseudo-colour image processing can be done.

21. Compare between JPEG and JPEG 2000 image compression standards.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain the fundamental steps involved in digital image processing.

23. Discuss how second derivatives can be used to sharpen a digital image.

24. Explain the Ideal, Butterworth and Gaussian filter implementation in frequency domain filtering.

25. Explain the various redundancies associated with an image and explain how these redundancies can be used for image compression.

(2×15=30)