B.E. INFORMATION TECHNOLOGY FOURTH YEAR SECOND SEMESTER - 2023

DIGITAL IMAGE PROCESSING

Time: 3 Hours   Full Marks: 100

[ANSWER ALL QUESTIONS]

CO1:

1. Explain in detail about fundamental steps in Digital Image Processing? Explain with the help of a block diagram. [10]
2. What are the differences between image enhancement and image restoration? [4]
3. What are the differences between city-block distance and chessboard distance? [4]
4. Define optical illusion. [2]

CO2:

5. Explain Discrete Cosine Transform in detail. [5]
6. Describe five major properties of 2D Discrete Fourier Transform. [10]
7. What is difference between Discrete Fourier Transform and Fast Fourier Transform? [5]

CO3:

8. Explain the geometric transformations used in image restoration. [10]
9. Define and describe using equations the five different noise distribution models? [10]

CO4:

10. Discuss in detail about Region based segmentation techniques. [10]
11. What is difference between Erosion and Dilation? [5]

CO5:

12. What do you mean by polygonal approximation? [5]
13. Explain briefly about types of regional descriptors with neat diagrams. [10]

CO6:

14. Explain Huffman coding with an example. [5]
15. A source emits three symbols A, B, C with their probabilities {0.5, 0.25, 0.25} respectively. Construct an arithmetic code to encode the word "CAB". [5]

-------X-------

CO1: Review the fundamental concepts of digital image processing (K2)
CO2: Analyze images in the transform domain using different transforms like FT, DCT, HT, KLT, etc. (K3)
CO3: Demonstrate the techniques for image enhancement. (K3)
CO4: Illustrate different techniques of Image segmentation including morphology. (K3)
CO5: Interpret image representation and description techniques. (K3)
CO6: Describe and illustrate various image compression techniques. (K3)