Reg. No. : | | | | | | | | | | | | |

Question Paper Code: 2434068

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV / DEC 2024
Fourth Semester
Artificial Intelligence and Data Science
U20AI404 – DIGITAL IMAGE PROCESSING
(Regulation 2020)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Define Image sampling and quantization.

2. What is Hue and saturation and Grey level?

3. List the 2 categories of image enhancement.

4. Write the steps involved in frequency domain filtering.

5. Define Image Restoration.

6. What is inverse filtering? Identify its drawbacks.

7. What is segmentation?

8. Define dilation and erosion.

9. What is image compression?

10. Define pattern.

PART – B (5 x 16 = 80 Marks)

11. (a) Explain the fundamental steps in image processing and also give the relationship between Pixels. (16)

(OR)

(b) Explain the HSI and RGB color image models. (16)

12. (a) Obtain the Histogram equalization for a (4 x 4) 4 bit per pixel is given by. (16)

$$\begin{bmatrix} 10 & 12 & 8 & 9 \\ 10 & 12 & 12 & 14 \\ 12 & 13 & 10 & 9 \\ 14 & 12 & 10 & 12 \end{bmatrix}$$

(OR)

(b) Develop the basics to explain spatial smoothening and spatial sharpening. (16)

13. (a) Draw the degradation model and explain and also explain how image restoration can be performed for black and white binary image. (16)

(OR)

(b) Explain the use of Wiener Filtering in image restoration and design the optimum Noted filter for periodic noise reduction by frequency domain filtering. (16)

14. (a) Write short notes on edge detection and edge linking methods using Hough transform. (16)

(OR)

(b) Explain how morphological processing is applicable for image processing with watershed segmentation algorithm. (16)

15. (a) Explain Huffman coding with an example. (16)

(OR)

(b) Design the JPEG baseline standard for compression and reconstruction of an 8 x8 sub image. (16)

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