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

Question Paper Code: 1216355

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV / DEC 2024
Sixth Semester
Biomedical Engineering
U20BM604 – MEDICAL IMAGE PROCESSING
(Regulation 2020)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. List the applications of color models?

2. Specify the elements of DIP system?

3. How do adaptive filters handle different types of noise in images?

4. Give the properties of the second derivative around an edge?

5. Define histogram.

6. Write the steps involved in frequency domain filtering.

7. How does noise reduction contribute to image improvement in diagnostic therapy?

8. How does mammographic X-ray equipment differ from conventional X-ray machines?

9. How are objects represented in image processing?

10. How does the process of image reconstruction differ between CT and MRI?

PART – B (5 x 16 = 80 Marks)

11. (a) Describe the fundamental steps in image processing? (16)

(OR)

(b) Descibe the HSI color image model. (16)

12. (a) Discuss the concept and application of optimum notch filtering in noise models for image processing. (16)

(OR)

(b) Discuss region-oriented segmentation in detail. (16)

13. (a) Describe sharpening spatial filters and their purpose in image processing. (16)

(OR)

(b) Discuss the process of smoothing an image using frequency domain filters. (16)

14. (a) Explain the mechanisms of X-ray interaction with biological tissues and the factors affecting their impact. (16)

(OR)

(b) Describe how CT imaging differs from conventional X-ray imaging, and discuss the significance of the cross-sectional images produced by CT. (16)

15. (a) Discuss the challenges associated with image restoration and describe the techniques used to overcome these challenges. (16)

(OR)

(b) Describe the process of image reconstruction in CT and discuss the applications and limitations of CT imaging. (16)

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