Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 21174

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Sixth Semester

Medical Electronics Engineering

BM 3314/080290042 — DIGITAL IMAGE PROCESSING

(Regulations 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What are the elements of visual perception?

2.   State the sampling theorem for image.

3.   State the 1D DFT pair equations.

4.   State the Haar wavelet function.

5.   What is image averaging?

6.   What is the principle of image restoration?

7.   Give the masks for point and edge detection.

8.   Give the directions for eight directional chain code.

9.   What is the need for data compression?

10.   What are the basic blocks in a general image compression system?

PART B — (5 × 16 = 80 marks)

11.   (a)   (i)   Explain the functioning of the elements used in a general image
                   processing system.

            (ii)   Describe the process of brightness adaptation and discrimination of
                   intensity levels of a human visual system.

                                            Or

      (b)   Explain the representation of a digital image and discuss about the
            spatial and intensity resolution of it.

12. (a) Explain the properties of 2D-DFT.

Or

(b) (i) State the 1D Walsh transformation and develop the 2D transformation from it. Describe the orthogonality and symmetry properties of the same.

(ii) Write notes on Haar wavelet transform.

13. (a) (i) Describe the following gray level transformation functions :

Contrast stretching, Intensity level slicing, and bit plane slicing.

(12)

(ii) Compare the above transformations with log transformation. (4)

Or

(b) (i) Explain the unconstrained method of image restoration. (12)

(ii) Describe the principle of inverse filtering. (4)

14. (a) Explain the region based segmentation by region splitting and merging method.

Or

(b) Write notes on :

(i) Signatures

(ii) Skeletons.

15. (a) Describe the variable length coding and for a source of your choice, obtain the code. How does it result in error free compression?

Or

(b) (i) Describe the transform coding in detail. Why is it called lossy compression?

(ii) Describe the still image compression standards.