Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

8·11·19 FN Lib

Question Paper Code : 91761

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Sixth/Seventh Semester

Information Technology

IT6005 – DIGITAL IMAGE PROCESSING

(Common to Biomedical Engineering/Computer Science and Engineering/
Electronics and Communication Engineering/Electronics and Instrumentation
Engineering/Instrumentation and Control Engineering/
Mechatronics Engineering/Medical Electronics)

(Regulations 2013)

(Also Common to PTIT 6005 – Digital Image Processing for B.E. Part-Time Sixth
Semester Electronics and Communication Engineering – Regulations 2014)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. What is Sampling and Quantization ?

2. List the various color models and give its application.

3. What would be the effect on the histogram if we set to zero i) higher order bit plane
   ii) lower order bit plane ?

4. How do you eliminate aliasing problem ?

5. How do you detect the discontinuities in a digital image ?

6. What is Blind image restoration ?

7. Compare and Contrast between Wavelet-coding and DCT-based coding.

8. What is the significance of lossy and lossless predictive coding ?

9. What is signature ?

10. What are the uses of Chain code ?

PART – B   (5×13=65 Marks)

11. a) I) Explain the fundamental steps in digital Image Processing System.   (8)

      II) Explain the image acquisition process by using sensor array.   (5)

              (OR)

    b) I) Explain the 3 types of Adjacency Relationship between pixels.   (8)

      II) Discuss the various distance measures used to find the Distance between two pixels.   (5)

12. a) I) Analyze the significance of Homomorphic filtering in image enhancement.   (5)

      II) Analyze how the various sharpening filters in spatial domain are used for Image enhancement.   (8)

              (OR)

    b) I) Apply various gray level transformations on an image and discuss its effects in Image Enhancement.   (8)

      II) Apply the Gaussian lowpass filter on an image and discuss its effects.   (5)

13. a) Design the following noise reduction filters for frequency domain.   (13)

      A. Bandreject Filters

      B. Notch Filters

      C. Wiener Filtering.

              (OR)

    b) I) Apply various Region based segmentation techniques on a image and discuss its pros and cons.   (9)

      II) How the Morphological operations help in image enhancement ?   (4)

14. a) I) Explain Arithmetic Coding technique with example.   (8)

      II) Briefly explain subband image coding.   (5)

              (OR)

    b) I) Explain the three redundancies in Image Compression.   (5)

      II) Briefly discuss the JPEG Compression standard.   (8)

15. a) Explain the structural methods in object recognition. (13)

(OR)

b) Explain the Regional descriptors in detail with a neat diagram. (13)

PART – C　　　　(1×15=15 Marks)

16. a) I) Analyse the different ways to estimate the degradation function in Image restoration. (8)

II) Apply LZW Coding Technique to encode and decode the following string bananabanana. (7)

(OR)

b) I) Develop a procedure for computing the median of an n × n neighborhood. (7)

II) Plot image histogram for the given example. (8)

1	4	3	11	7
15	4	0	7	9
9	13	12	5	0
5	6	1	2	13
10	0	8	6	0

––––––––––