MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : PE-EC702B Digital Image and Video Processing

UPID : 007712

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) Which of the followings is a type of descriptors ?
a) Boundary and Region b) Fourier descriptor c) Moments d) all

(II) Name one lossy image compression technique.

(III) Name one spatial averaging filter in which all the coefficients are equal.

(IV) In which part of eyeball no optical nerve is present?

(V) Using which filter Salt and pepper noise can be removed?

(VI) State the purpose of using Chain code?

(VII) A low contrast image will have what kind of histogram?

(VIII) What is the general form of representation of power transformation?

(IX) Data compression becomes essential due to which of the followings?
a) Storage b) Transmission c) Faster Computation

(X) Wavelet transform is a special case of which transform?

(XI) Which part of human eye is Photosensitive detector?

(XII) In a dark image, the components of histogram are concentrated on which side of the grey scale?

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. Explain one motion estimation technique [5]

3. Define 4-adjacency, 8-adjacency with proper example. [5]

4. 8-directional chain code of an object is given as 7 8 8 7 7 0 3 1 2. What is the perimeter of the object? (hint: even count+√2 odd count) [5]

5. A video has one frame of size 640×480 with 3 bytes/pixel. It is assumed that the video is taken at 30 frames/s. What is the storage and transmission time requirement at a rate of 64 kbps? [5]

6. Explain any one method of color image segmentation. [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. a) What do you mean by redundancy? Name different types of image compression. [4+6+5]
b)What is compression ratio? An image is 8MB before compression and 2MB after compression. Find compression ratio and savings percentages.
c) Describe smoothing linear spatial filtering. What is bit plane slicing method?

8. a) What do you mean by image recognition ? [5+5+5]
b) What is meant by classification of image?
c) Describe any image recognition technique.

9. a) Explain HUV and HIS colour model. [5+5+5]
b) How can we convert colour image to grey scale image?
c) Explain colour slicing.

10. a) Explain Brightness adaptation [5+5+5]
b) Define digital image and image pixel.
c)Consider the image segment

3	4	1	2	3 q
0	1	0	4	2
2	2	3	1	4

3	0	4	2	1
p 4	2	2	3	4

11. a) What is the need for compression? Name different compression techniques. [5+5+5]
    b) Why do we need Log Transformation in dynamic compression?
    c) Generally, transmission is accomplished in packets consisting of a start bit, a byte (8 bits) of information, and a stop bit. What would the time be at 3000K baud, a representative medium speed of a phone DSL (Digital Subscriber Line) connection to transmit a 1024 x 1024 image with 256 Intensity levels?

*** END OF PAPER ***