Name : ……………………………………………………

Roll No. : …………………………………………………

Invigilator's Signature : …………………………………

CS/MCA/SEM-5/MCAE-501B/2011-12
2011
IMAGE PROCESSING

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Objective Type Questions)

1.   Anser any *ten* of the following in not more than *two* sentences each :   10 × 1 = 10

   i)   What is negative image ?

   ii)   What is recursive filter ?

   iii)   What is pixel ?

   iv)   Define Signal to Noise Ratio (SNR).

   v)   What is image averaging ?

vi) Write down the expression of Fourier transform $F(w)$ of the function $f(t)$.

vii) How can a monochromatic digital image be represented ?

viii) What is convolution ?

ix) Write down the orders of complexity in FFT.

x) Is Huffman coding lossless ?

xi) Define compression ratio.

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following. $3 \times 5 = 15$

2. Differentiate between lossy and lossless compressions with suitable examples.

3. Explain the terms 'mean filtering' and 'median filtering'.

4. Determine the Fourier transform of the Dirac delta function, $\delta(x)$.

5. Briefly discuss the elements of visual perception.

6. Define two dimensional discrete cosine transform DCT-II. State the conditions under which this transformation should be used.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) State and explain the fundamental steps in digital image processing. 8

   b) How are images digitized ? Explain with an example. 7

8. Describe the elements of visual perception, clearly indicating the image formation, brightness adaptation and discrimination in the eye.

9. a) What is filter ? Explain in detail how spatial filtering is done, clearly indicating the factors to be considered for choice of mask. 9

   b) What is histogram of a digital image ? Describe one use of image histogram in digital image processing. 2 + 4

10. a) Why is transformation of image done from spatial domain to frequent performed ? Name three such transformation methods and compare them critically. 9

    b) What is data redundancy and relative data redundancy ? Explain with suitable examples. 6

11. Write short notes on any *three* of the following : 3 × 5

    a) KL transformation and its application

    b) Enhancement and segmentation of images

    c) Constrained and unconstrained restoration methods

    d) Run length coding

    e) Image processing system.

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