	Utech
Name:	
Roll No.:	A Special (V Execution 2nd Explant)
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 : $10 \times 1 = 10$
 - 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?

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- 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

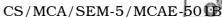
(Short Answer Type Questions)

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

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GROUP - C

(Long Answer Type Questions)

Answer any three of the following.



- 7. a) State and explain the fundamental steps in digital image processing.
 - 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.
 - 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 dataredundancy? 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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