



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech/ECE/SEM-8/EC-803D/2013
2013
DIGITAL 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
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

$10 \times 1 = 10$

i) Digital Image Processing deals with

- a) analog signal
- b) digital signal
- c) discrete signal
- d) (b) & (c) both.



ii) The common major of transmission of digital data is

- a) bit rate
- b) baud rate
- c) frame per second
- d) none of these.

iii) HDTV stands for

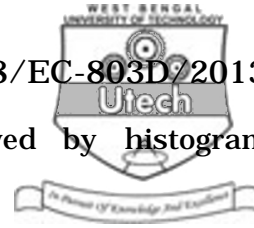
- a) High Definition Television
- b) High level Digital Television
- c) (a) & (b) both
- d) none of these.

iv) Image restoration is a / an

- a) subjective process
- b) objective process
- c) (a) & (b) both
- d) none of these.

v) Huffman coding approach reduces

- a) noise
- b) coding redundancy
- c) dynamic range of intensities
- d) none of these.



vi) Which of the following is improved by histogram technique ?

- a) Contrast
- b) Sharpness
- c) Brightness
- d) Both (a) and (b).

vii) Wiener Filter is used for

- a) restoration
- b) smoothening
- c) sharpening
- d) none of these.

viii) Representation & description almost always follow the output of a

- a) segmentation stage
- b) filtering stage
- c) compression stage
- d) all of these.



- ix) The basic principle of compression matches the principle of
- a) Channel coding
 - b) Line coding
 - c) Source coding
 - d) All of these.
- x) Discrete cosine transform is a
- a) Real Transform
 - b) Imaginary Transform
 - c) both (a) and (b)
 - d) none of these.
- xi) Averaging filter is used for
- a) sharpening
 - b) contrast
 - c) brightness
 - d) smoothing.
- xii) How many numbers of colours are present in RGB ?
- a) 3
 - b) 6
 - c) 216
 - d) 256.

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GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What do you mean by Digitization ? Explain its two important steps. $2 + 3$
3. Write down the key stages in Digital Image Processing & explain.
4. What is the "frequency" of an image ? Explain the smoothing frequency domain filters. $2 + 3$
5. What is image sampling ? Distinguish between image enhancement and image restoration. $2 + 3$
6. What is 8 bit colour image ? For what purpose could it be used ? Explain. $3 + 2$

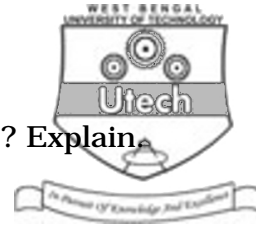
GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What is the difference between local and global thresholding ? 5
b) Explain Hough transformation and describe its application in image processing. 10

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8. a) What do you mean by image negative ? Explain.
- b) Explain Intensity slicing with example.
- c) Why do we need Log Transformation in dynamic range compression ? 5 + 5 + 5
9. a) Explain the restoration model for continuous function in detail.
- b) What is the role of quantization in image processing ?
- c) What is the difference between lossy and lossless compression ?
- d) What is salt and pepper noise ? What is Gaussian noise ? 5 + 3 + 2 + (3 + 2)
10. a) Draw the schematic diagram of 2-D DWT synthesis filter bank structure for Haar Wavelet Transform and explain the components.
- b) State the JPEG compression algorithm and draw the schematic diagram of JPEG compressor. 8 + 4 + 3



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

- a) Spatial filtering
- b) Wiener filtering
- c) Contrast stretching
- d) Histogram specification
- e) Wavelet
- f) Point processing.

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