

BE8-R3: DIGITAL IMAGE PROCESSING

NOTE:

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.

- a) Distinguish between RGB and HIS color models?
- b) What is role of knowledge base in steps of image processing?
- c) Explain, how the Haar transform is useful in image processing.
- d) What do you mean by CCD Technology?
- e) Define one-dimensional Fourier transform pair. Prove that the imaginary part of Fourier transform of the even function is zero.
- f) Compare minimum mean square error filtering with inverse filtering.
- g) What is LZW encoding? Give its applications.

(7x4)

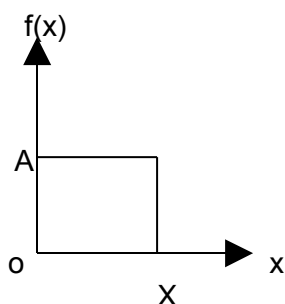
2.

- a) A common measure of transmission for digital data is the baud rate, defined as the number of bits transmitted per second. Generally, transmission is accomplished in packets consisting of a start bit, a byte (8 bits) of information and a stop bit. Using this approach, answer the following:
 - i) How many minutes would it take to transmit a 512 x 512 image with 256 gray levels at 300 baud?
 - ii) What would the time be at 9600 baud?
- b) How many types of connectivity are there in the neighborhood pixels, explain them?

(9+9)

3.

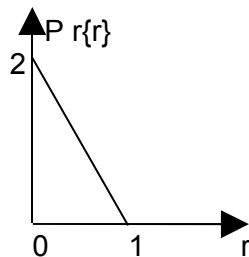
- a) Find the Fourier transform and spectrum for given simple function?



- b) Discuss Huffman Coding algorithm? What is the difference between Run-length coding and Block Coding?

(9+9)

- 4.
- Explain the difference between spatial domain methods and frequency Domain methods of Enhancement.
 - What is Histogram processing? Explain the Histogram equalization and apply on the following density function.



(9+9)

- 5.
- What do you mean by color models? Explain RGB and CMY color model. Explain the Smoothing filters.
 - Derive an expression of gradient in terms of pixel gray levels using the best-plane fit approach.

(9+9)

- 6.
- What is digital image compression? Describe the data redundancy identified in image compression.
 - Explain, briefly image techniques that improve the quality of image.

(10+8)

- 7.
- Describe the restoration process with the help of Degradation model.
 - Explain the Media filter technique and the advantages and disadvantages of median filter over the mean/average filter technique.

(10+8)