Total number of printed pages – 4

B. Tech

CPEC 5402

Seventh Semester Examination – 2008

DIGITAL IMAGE AND SPEECH PROCESSING

Full Marks – 70

Time – 3 Hours

Answer Question No. 1 which is compulsory and any ***five*** *from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (i) What do mean by Gray level resolution ?

   (ii) What is histogram based processing ?

   (iii) How a discrete time signal is different than a digital signal ?

P.T.O.

(iv) How wavelet transform is different from Fourier transform ?

(v) What is Image Morphology ?

(vi) What are the advantages of FIR systems over IIR systems ?

(vii) Give the mathematical models of digital image and digital speech.

(viii) What is image blur ? How it can be removed ?

(ix) What is adaptive quantization ?

(x) Write the principle of a speaker recognition system ?

2. (a) Explain different image formation models. 7

(b) What are the components of an Image Processing system ? 3

3. Explain how image enhancement is achieved using Gray level transformation and using logical operations. 10

4. Describe the image degradation model using a neat diagram. Explain different image restoration techniques. 10

5. (a) Suppose a digital image is subjected to histogram equalization. Show that the second pass of histogram equalization will produce the same result as the first pass. 5

(b) How DFT is different form DTFT ? Describe the properties of DFT. 5

6. Explain different time domain methods of speech processing. 10

7. (a) What are the basic principles of Linear Predictive Analysis ? 7

(b) Give a block diagram for speech production. 3

8. Write short notes on the following : 2.5×4

(i) Color image processing

(ii) Image Compression

(iii) Homomorphic Filtering

(iv) Multispectral Image Processing.

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