H 1171

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Sixth Semester

Computer Science and Engineering

CS 040 — DIGITAL SPEECH AND IMAGE PROCESSING

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the importance of digital speech processing?

2. What is the use of delta modulation?

3. Expand the following :

   (a) CELP

   (b) MELP.

4. What do you mean by formant frequency?

5. What are the main features of K-L Transform?

6. Define Histogram equalization.

7. Define compression ratio.

8. What do you mean by Edge detection?

9. List out the logic operations involved in binary images.

10. Give the dilation and erosion operators.

PART B — (5 × 16 = 80 marks)

11. (i) With a neat sketch, explain the modules of linear predictive analysis. (8)

(ii) Write short notes on the following : (8)

(1) DFT for speech processing

(2) Estimation frequency.

12. (a) (i) With a neat sketch, explain the Linear predictive synthesis modules. (10)

(ii) Write short notes on CELP. (6)

Or

(b) Describe various speech recognition and speech encoding methods. Give some applications of each one. (16)

13. (a) (i) Explain various smoothing filters. (6)

(ii) What are the advantages of DCT over DFT? (6)

(iii) Write brief note on circulant matrices. (4)

Or

(b) (i) Describe various sharpening spatial filters. (6)

(ii) Explain discrete Hadamard Walsh Transform. (6)

(iii) Explain any four properties of 2-D Fourier transform. (4)

14. (a) (i) With a neat sketch, explain various modules of JPEG still image compression standard. (10)

(ii) Explain line and edge detection methods. (6)

Or

(b) (i) Explain the role of illumination. (5)

(ii) Explain the concept of optimal thresholding. (5)

(iii) Differentiate between RGB and YIQ color models. (6)

r predictive analysis. (8)

(8)

predictive synthesis

(10)

(6)

oding methods. Give

(16)

(6)

(6)

(4)

(6)

(6)

m. (4)

PEG still image

(10)

(6)

(5)

(5)

(6)

(i) Explain the following morphological operations in detail. (1

(1) thinning

(2) thickening

(3) pruning

(4) opening.

(ii) Explain the basic components of an expert system. (

Or

(b) (i) Give the semantic graph partitions for the waste basket problem.

(8

(ii) Give the semantic network model for commercial airport. (8