L 1113

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

Fourth Semester

Information Technology

IT 1251 — INFORMATION CODING TECHNIQUES
(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Derive the entropy for Binary memory less source.

2. What is Channel Coding theorem?

3. What is the difference between midtread and midrise quantization?

4. What is the condition for slope overload in delta modulation?

5. What is the dual of (15, 7) Hamming Code?

6. Define error burst.

7. Which compression schemes can be used for Text files?

8. Derive the binary form of the following run-length encoded AC coefficients :

   (0, 6) (0, 7) (3, 3)

9. What is temporal masking?

10. What are the two types of compressed frames that is used for video compression?

PART B — (5 × 16 = 80 marks)

11. (i) Explain briefly about source coding theorem. (6)

    (ii) Given five symbols *s0, s1, s2, s3* and *s4* with their respective probabilities 0.4, 0.2, 0.2, 0.1 and 0.1. Use Huffman's encoding for symbols and find the average code word length. Also prove that it satisfies source coding theorem. (10)

12. (a) (i) Explain uniform and non-uniform quantizer. (6)

(ii) With the aid of a block diagram explain Time-Division multiplexing. (10)

Or

(b) Describe the characteristics of PCM system known as the T1 system, which carries 24 voice channels over separate pairs of wires with regenerative repeaters spaced at 2 KM intervals. (16)

13. (a) (i) For the repetition code (1, 5), find all possible code words. (6)

(ii) With an example, explain syndrome decoding in Linear Block of Codes. (10)

Or

(b) How are Encoder and Decoder Circuits constructed for Cyclic Codes? (16)

14. (a) (i) Explain briefly about Lossless and Lossy Compression Algorithms. (8)

(ii) How are digitized documents compressed? (8)

Or

(b) (i) With the aid of block diagram explain JPEG encoder. (10)

(ii) What are the advantages and disadvantages of static and dynamic Huffman Coding? (6)

15. (a) (i) With the aid of a block diagram explain forward and backward adaptive bit allocation schemes in Dolby audio coders. (10)

(ii) With the aid of a block diagram explain hybrid adaptive bit allocation (Dolby Ac-3). (6)

Or

(b) (i) With a schematic diagram explain MPEG perceptual encoder. (10)

(ii) Briefly explain the three standards of MPEG and mention an application for each of these standards. (6)
