

Question Paper Code : C 1333

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010.

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. What is the relationship between uncertainty and information?
2. State channel capacity theorem.
3. What is the advantage of Adaptive Delta Modulation?
4. What is a Vocoder?
5. What is the use of linear block code?
6. How is a convolutional code different from a block code?
7. What is Graphics Interchange Format (GIF)?
8. Why is dynamic Huffman coding employed?
9. What is the basic concept of Linear Predictive Coding?
10. What is perceptual coding?

11. (a) (i) A discrete memoryless source generates symbols s_0, s_1, s_2, s_3, s_4 with probability statistics, $\frac{1}{2}, \frac{1}{8}, \frac{1}{8}, \frac{1}{8}$ and $\frac{1}{8}$. Find out the Entropy of this source. (4)

(ii) A DMS has the following behavioural pattern.

Symbols Probability

s_0 1/4

s_1 1/4

s_2 1/8

s_3 1/8

s_4 1/16

s_5 1/16

s_6 1/16

s_7 1/16

Compute Shannon Fano Code for this symbol set. (12)

Or

(b) (i) State source coding theorem and channel coding theorem. Discuss in detail about the implications of these two theorems in Information theory. (6)

(ii) A telephone channel has a bandwidth of 4 KHz and signal to noise ratio of 31. What is the capacity of this channel? Suppose, the channel were to be provided with 64 kbps capacity, what is the required signal to noise ratio? (4)

(iii) Define a discrete memoryless channel. Discuss in detail about its attributes (properties). (6)

12. (a) (i) With relevant block diagram and expressions, discuss in detail about a Delta Modulation Scheme. (12)

(ii) A signal $A_m \cos w_{mt}$ is to be transmitted by Delta modulation Scheme. What is the condition required to be satisfied by the system to avoid slope overload? (4)

Or

(b) (i) Discuss in detail the adaptive subband coding and justify its importance and relevance. (12)

(ii) In what way, a ADPCM system different from DPCM scheme? What are the advantage/disadvantage of ADPCM? (4)

13. (a) (i) With relevant block diagram, describe the encoder for cyclic code. Discuss the various steps involved in the procedure. (12)
- (ii) What is a syndrome? How does it relate to the presence/absence of error in the received code word? (4)

Or

- (b) (i) Discuss in detail about linear block codes and the relation between message block, codeword block and parity bit block. (10)
- (ii) Explain convolutional encoder with an example. (6)

14. (a) Why do we require compression techniques in information coding? Discuss in detail about static Huffman Coding and Dynamic Huffman Coding, clearly bringing out their similarities and differences. (16)

Or

- (b) (i) Discuss JPEG standards in detail. (10)
- (ii) What is Tagged Image File Format? Explain in detail. (6)

15. (a) With relevant block diagram, figures and expressions, discuss about a code excited LPC scheme. (16)

Or

- (b) Discuss in detail about H.261 Video Compression algorithm and MPEG Video standards. (16)
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