Reg. No. : | | | | | | | | | | |

Question Paper Code: 55406

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Fifth Semester

Electronics and Communication Engineering

01UEC506 – INFORMATION THEORY AND CODING

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. A source x generates four symbols with probabilities $P(x_1) = 0.5$, $P(x_2) = 0.3$, $P(x_3) = 0.1$ and $P(x_4) = 0.1$. Calculate entropy of this source.
2. State channel capacity theorem.
3. List the three features which determine the perception of a signal by the ear.
4. Explain about channel vocoder.
5. What is SIF?
6. Define prediction span.
7. Define Hamming weight.
8. What is syndrome?
9. Draw the diagram of Block Encoder.
10. Define turbo code.

PART - B (5 x 16 = 80 Marks)

11. (a) State and prove Kraft inequality theorem and source coding theorem. (16)

Or

(b) Describe the different types of channels used in information coding techniques. (16)

12. (a) Discuss the encoding procedure of LZW compression. Also construct an encoding table for any sentence. (16)

Or

(b) With neat illustrations explain linear predictive coding. (16)

13. (a) With a neat schematic, describe JPEG encoder and decoder. (16)

Or

(b) Explain briefly about I/B/P frames. (16)

14. (a) For a (7, 4) code with generator matrix $G = \begin{vmatrix} 1 & 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 & 1 \end{vmatrix}$

(i) Find all possible code words. (8)

(ii) Find parity check matrix *H*. (8)

Or

(b) Discuss in detail about cyclic codes. (16)

15. (a) Describe the principle of turbo coding. (16)

Or

(b) Describe about sequential search and Viterbi algorithm for decoding of convolutional codes. (16)

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