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Question Paper Code: 31456

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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. Define source coding theorem.
2. List the properties of mutual information.
3. State the principle of Psychoacoustic model.
4. What is Dolby AC3?
5. What is meant by motion estimation?
6. Distinguish between motion compensation and estimation.
7. What is Hamming distance? Give an example.
8. Give the properties of syndrome polynomial.
9. Define constraint length in convolutional codes.
10. Define turbo code.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Apply the Shannon-Fano algorithm to a source which generates symbols x_1, x_2, x_3, x_4 with the probabilities 1/8, 1/2, 1/4 and 1/8 respectively. Calculate the code efficiency. (8)

(ii) Discuss about mutual information and its properties. (8)

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) (i) Explain the working principle of Dolby AC-3 coder. (8)

(ii) Describe about linear predictive coding. (8)

13. (a) With the neat block diagram, explain the working of JPEG encoder and decoder. (16)

Or

(b) Show and explain how do you encode and decode I / B / P frames. (16)

14. (a) Show and verify whether g(x) = 1 + x + x + x is a valid generator polynomial for generating a cyclic code for message [111]. (16)

Or

(b) (i) Discuss linear block codes in detail. (10)

(ii) Consider the generation of a (*7,4*) cyclic code by generator polynomial $g(x)= 1+x+x^3$. Calculate the code word for the message sequence 1001. (6)

15. (a) (i) Describe the principle of turbo coding. (10)

(ii) Compare code tree with trellis diagram. (6)

Or

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

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