Reg. No. :

Question Paper Code: 45406

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Electronics and Communication Engineering

14UEC506 - INFORMATION THEORY AND CODING

(Regulation 2014)

Duration: 1.15 hrs   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Huffman coding technique is adopted for constructing the source code with _____ redundancy.

    (a) minimum   (b) constant   (c) maximum   (d) unpredictable

2. In channel coding theorem, channel capacity decides the _____ permissible rate at which error free transmission is possible.

    (a) maximum   (b) minimum   (c) constant   (d) none of these

3. Which among the following compression techniques is/are intended for still images?

    (a) JPEG   (b) H.263   (c) MPEG   (d) All the above

4. The bit allocation information mode that is used by the decoder to dequantize the set of sub band samples in a Dolby AC-1 is known as

    (a) Forward adaptive bit allocation   (b) Backward adaptive bit allocation
    (c) hybrid adaptive bit allocation   (d) none of the above

5. The compression ratio achieved by JPEG2000 without loss of quality is

    (a) 2000:1   (b) 200:1   (c) 20:1   (d) 2:1

6. The compression ratio achieved by MPEG-1 standard is

(a) 4000:1   (b) 400:1   (c) 40:1   (d) 4:1

7. The minimum distance of linear block code (d_{min}) is equal to minimum number of rows or columns of H^T, whose _____ is equal to zero vector?

     (a) sum   (b) difference   (c) product   (d) divison

8. If the parity check matrix is H and the error vector is E then syndrome vector S can be calculated by

     (a) $S = HE^H$ (b) EH^T (c) $E^T H^T$ (d) $(EH)^T$

9. While representing the convolutional code by (n, k, m), what does 'm' signify or represent in it?

     (a) memory order   (b) message bits   (c) coded bits   (d) all the above

10. In Viterbi's algorithm, the selected paths are regarded as

     (a) survivors   (b) defenders   (c) destroyers   (d) carriers

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Generate Shannon-Fano binary, Quaternary codes with probabilities 0.5, 0.25, 0.125, 0.0625, 0.03125, 0.015625, 0.0078125 and 0.0078125. Calculate its efficiency in each case. (8)

12. Apply Arithmetic coding for the word 'WENT.' (8)

Symbol	W	E	N	T	.
Probability	0.1	0.3	0.3	0.2	0.1

13. Discuss in detail about the Image and Video formats. (8)

14. The generator polynomial of a (7,4) cyclic code is $G(P) = P^3 + P + 1$. Find all the code vectors for the code in the systematic and non-systematic form. (8)

15. Discuss on convolutional turbo codes. (8)

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