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Total No. of Pages : 02

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**M.Tech. ECE (Wireless Communication) (2018 Batch) (Sem.–1)**

**INFORMATION THEORY AND CODING**

**Subject Code : MTWC-102-18**

**M.Code : 75798**

**Time : 3 Hrs.**

**Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

**1. Attempt any FIVE questions out of EIGHT questions.**

**2. Each question carries TWELVE marks.**

1. a) Define :
  - i) Self-information
  - ii) Rate of source
  - iii) Entropy of source with an example.
- b) What is Markoff information source? What is the use of the tree diagram representation for such a source? Define the terms Entropy and information rate of Markoff sources.
2. a) Differentiate adaptive Huffman coding and Arithmetic coding.
- b) Explain in brief linear predictive coding.
3. a) Explain prefix coding and decision tree with examples.
- b) Derive an equation for the capacity 'c' of a channel of bandwidth B Hz effected by additive white Gaussian noise of power spectral density of  $N_0/2$ .
4. a) Explain the error correction procedure for cyclic codes.
- b) Define hamming weight, hamming distance, and minimum distance for linear block codes.

5.
  - a) If  $C$  is valid code vector, then prove that  $CH^T = 0$ , where,  $H^T$  is transpose of parity check matrix  $H$ .
  - b) What are the binary cyclic codes? Describe the features of encoder and decoder used for cyclic code using  $(n-K)$  bit shift register.
6.
  - a) What are different methods of controlling errors? Explain.
  - b) What are convolution codes? How is it different from block codes?
7.
  - a) Explain Trellis diagram with suitable example.
  - b) Explain the principle of Turbo coding.
8. Write short note on :
  - a) Shortened cyclic codes
  - b) Golay codes

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**