PVP 12

Code: CS3T5

II B.Tech - I Semester – Regular Examinations - January 2014

INFORMATION THEORY

(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Write a brief notes on Dictionary codes 4 M

   b) What are the important properties of codes while encoding a source? 5 M

   c) Explain about arithmetic coding. 5 M

2. a) State and prove Extended Kraft Inequality 7 M

   b) Construct a binary Huffman code for the following distribution of five symbols p=(0.3,0.3,0.2,0.1,0.1). What is the average length of this code 7 M

3. a) Write a brief notes on Hamming codes 10 M

   b) List the properties of Channel Capacity 4 M

4. a) Define

i) Joint entropy; and

ii) Conditional entropy. 4 M

b) Explain the relation of Differential Entropy to Discrete Entropy 6 M

c) What are the properties of Entropy and mutual Information 4 M

5. Write a brief notes on Gaussian Channels and band limited channels 14 M

6. a) State and prove Conditional Limit Theorem 9 M

b) State and prove Cramer Rao Inequality 5 M

7. a) Explain about characterization of Rate Distortion Function 6 M

b) Calculate the Rate distortion function of a binary source and Gaussian source. 8 M

8. a) Briefly explain Gaussian Broadcast channel and Gaussian Relay channel 6 M

b) What is source coding with side information and also state and prove the theorem 8 M