S.E(IT)(INFORMATION TECHNOLOGY)(SEM IV)(REV) EXAMINATION, OCTOBER, 2006
Information Theory and Coding

[REVISED COURSE]

CON/5079-06. YM-5512

7/6/2006

(3 Hours) [Total Marks : 100

N.B. : (1) Attempt any five questions only.
(2) Assumptions made should be clearly stated.
(3) Assume any suitable data wherever required but justify the same.
(4) Figures to the right indicate full marks.
(5) Illustrate answers with sketches wherever required.
(6) Answers to questions should be grouped and written together, i.e. all answers to sub-questions of individual questions like Q.Nos. 1, 2 & 3 etc. should be answered one below other.
(7) Write answers legibly with Blue/Black ink pen. Use of pencil should be done only to draw diagrams and graphs.

1. (a) (i) How is Entropy measured ? Explain the physical significance of Entropy in Information Theory. 5
(ii) What do you mean by Coding Efficiency and Redundancy ? 5
(b) State Source Coding Theorem and Channel Coding Theorems. Explain in brief. 10

2. (a) State the broad-level steps in DES. 10
(b) Explain RSA Algorithm. 10

3. (a) Explain Diffie-Hellman Algorithm. Which attack is it vulnerable to ? 10
(b) Compare Symmetric versus Asymmetric Key Cryptography. 10

4. Write short notes on the following : 4x5
(a) Huffman Coding
(b) Hamming Code
(c) JPEG
(d) Run-length Coding.

5. (a) (i) Explain Convolution Coding in brief. 5
(ii) Compare Source Coding with Channel Coding. 5
(b) Define— 10
(i) Hamming Weight
(ii) Hamming Distance
(iii) Code Rate
(iv) Syndrome
(v) Linear Code Properties. 5x2

6. (a) Name the Source Coding Techniques used in the following types of Files and classify them as Lossy or Lossless : 15
5x3
(i) .zip
(ii) .jpg
(iii) .mpg
(iv) .bmp
(v) .gif
(b) Differentiate Compression Rate from Compression Ratio. 5

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