

SE (IT) Sem IV C B C  
Info. Th. & coding **QP Code : 30802**

(3 Hours)

[Total: 80 marks]

- Note:** 1. Question no.1 is compulsory  
2. Answer three questions out of remaining five questions  
3. Figures to right indicate marks  
4. Answers of same questions to be grouped and written

1. a) write a note on convolution code. [4]  
b) State Fermat's little theorem and its applications [4]  
c) Define entropy and explain types of entropy [4]  
d) Explain cyclic codes. [4]  
e) What is compression. List different compression algorithm. [4]
2. a) Name the source coding technique used in the following types of files and Classify them as lossy or lossless. [10]  
i).Zip ii).jpg iii).mpg iv).bmp v).gif  
b) For(7,4) cyclic code, find out the generator matrix if  $G(D)=1+D+D^3$  [10]
- 3 a) Explain Diffie-Hellman algorithm. Which attack is it vulnerable to? [10]  
b) Construct Huffman code for the given symbols  $\{x_1, x_2, \dots, x_8\}$  with probabilities  $P(x) = \{0.07, 0.08, 0.04, 0.26, 0.14, 0.09, 0.07, 0.25\}$   
Find coding efficiency. [10]
4. a) Explain LZW compression with example. [10]  
b) State Chinese Remainder theorem. Using it solve for X.  
 $X=1 \text{ MOD } 2$   
 $X=2 \text{ MOD } 3$   
 $X= 2 \text{ MOD } 5$  [10]
- 5 a) what do you mean by symmetric key cryptography? Explain DES in detail. [10]  
b) Define i)Hamming weight ii)Hamming Distance iii)Syndrome  
iv)Linear code properties v)Code Efficiency [10]
6. Write short notes on [20]  
a) RSA  
b) RLE  
c) Security Goals  
d) Digital signature.