

- N.B. (1) Q. No. 1 is compulsory.  
 (2) Attempt any four out of remaining six questions.  
 (3) Assume suitable data wherever required.  
 (4) Figures to the right indicate full marks.  
 (5) Answers to the questions should be grouped and written together.
1. (a) Explain the terms "Frequency Masking" and "Temporal Masking" with respect to Audio Compression. 5  
 (b) Justify the need for "Cryptography". Explain different types of Cryptographic Techniques. 5  
 (c) Discuss the drawbacks of statistical methods. 5  
 (d) What are Message Authentication Codes ? Where we use it ? 5
  2. (a) A source emits five symbols a,b,c,d,e with probabilities 0.25, 0.25, 0.25, 0.125, 0.125 respectively. Calculate :- 10  
 (i) Entropy of Source.  
 (ii) Find Huffmann Code using standard method.  
 (iii) Find Shanon Fano Code.  
 (iv) Find Average Length of Code and redundancy.  
 (b) What are dictionary based compression schemes ? Explain LZ77 with suitable example. 10
  3. (a) Explain different types of Cipher Modes of Operation. 10  
 (b) An Initial dictionary consists of letters a,b,r,y,z encode the following message with LZW algorithm :- 10  
 "hzbarrzarrayzbyzbarrayarzvay".
  4. (a) Explain the Working of DES algorithm in details. 10  
 (b) What is Linear Predictive Coding ? Explain CELP and MELP in details. 10
  5. (a) What is Motion Compensation ? Explain the working of MPEG in details. 10  
 (b) What is RLE ? How it can be used in Image Compression ? 10
  6. (a) Explain the encoding and decoding process used in Arithmetic Coding. Compare it with Hoffman coding. 10  
 (b) Describe the best and worst case Scenario for LZ77 algorithm. Also explain LZ78 algorithm specifying improvement over LZ77. 10
  7. Write short notes on any two :-  
 (a) RSA algorithm.  
 (b) One way hash function.  
 (c) Text compression using PPM Method.  
 (d)  $\mu$ -Law and A-Law Companding.