Question Bank

Subject: BTETPE405B Data compression and Encryption

Unit: 1 Data compression and Encryption

1. What is data compression? Explain with the help of block diagram.
2. Explain different methods in data compression.
3. Write short note on RLE for text compression.
4. Write short note on RLE for image compression.
5. What is Symmetrical compression?
6. Write short note on Scalar Quantization.
7. What is Lossless data compression? Give its example.
8. What is Lossy data compression? Give its example.

Unit: 2 **Statistical Methods and Dictionary Methods**

1. Alphabet with Probabilities {0.4, 0.2, 0.2, 0.1, 0.1} for {a,b,c,d,e} find the following 1) Huffman codes by keeping the probabilities as high as possible 2)Efficiency 3)Variance
2. Using Arithmetic Coding Decode the message 0.572 in the given coding model.

Symbol	O	S	!
Probability	0.4	0.5	0.1

3. Write down the steps of Shannon-Fano coding and Find the Code words and Efficiency occurring in the probability {1/2, 1/4, 1/8, 1/8} for the symbols P, Q, R and S.

4. Write a Short note on LZ- 78 and encode the following sequence using Lempel-Ziv-78 approach.

   Sequence: ABCDABCABCDAABCABCE

5. Explain what is Coding Redundancy?
6. Wright short note on Variable Size code, also give its example.
7. Wright short note on prefix code, also give its example.
8. Write down the steps of Shannon-Fano coding.
9. Write down the steps of Huffman coding.
10. What is string compression?
11. Find the Shannon- fano code word by occurring in the probabilities {1/2, ¼, 1/8, 1/8} for the symbols P, Q, R, S and find efficiency.
12. Find the Shannon- fano code word occurring in the probabilities {1/4, 1/4, 1/8, 1/8, 1/16, 1/16, 1/16, 1/16} for the symbols P, Q, R, S, T, U, V, W and find efficiency and redundancy.
13. Apply Shannon-fano coding for following message [x]= [X_1, X_2, X_3, X_4, X_5, X_6] and probabilities are {P}= {0.30, 0.25, 0.15, 0.12, 0.08, 0.10} also find its efficiency and redundancy.

14. Alphabet with Probabilities {0.4, 0.2, 0.2, 0.1, 0.1} for {a,b,c,d,e} find the following 1) Adaptive Huffman codes 2)Efficiency 3)Variance
15. Image size is 10 × 10 (5 bit image) and frequencies are X_1 = 10, X_2=40, X_3=6, X_4=10, X_5=4, X_6=10 find its Entropy and Average length of code word?
16. Solve using Arithmetic encoding: consider the transmission of message "**went.**" Compressing a string of characters with probability 'e'= 0.3, 'n'=0.3, 't'=0.2, 'w'=0.1, '.' =0.1.
17. Write a short note on LZ77.
18. For the sequence of alphabets given below demonstrate the encoding process using LZ77 approach : c a b r a c a d a b r a r r a r r a d
19. For the sequence of alphabets given below demonstrate the encoding process using LZW. Construct the dictionary & obtain the encoded output sequence.
    Sequence: w a b b a ƀ w a b b a ƀ w a b b a ƀ w a b b a ƀ w
20. Decode the following sequence using LZW
    Sequence: "3, 1, 4, 6, 8, 4, 2, 1, 2, 5, 10, 6, 11, 13, 6"
    Initial dictionary:

Index	Entry
1	a
2	ƀ
3	r
4	t

Unit 3: Image Compression

1. Discuss the various lossless techniques in image compression.
2. What are the different approaches for compressing an image? Explain JPEG-LS Standards.
3. Explain the Differential Pulse code modulation technique.
4. Explain the need for Image compression.
5. Discuss Two dimensional discrete cosine transform and give its application in lossy image compression.
6. Write a short note on Zig-Zag coding Sequence.
7. Write a short note on Quantization in image compression.
8. Explain the type of DCT.
9. State the limitation of JPEG Standard
10. List the advantages of JPEG standard.
11. Write a Short note on MPEG Video Standard.
12. Explain the MPEG industry Standards.
13. What is Old JPEG standard?
14. Write a short note on Gray code and give its example.
15. Discuss one dimensional discrete cosine transform and give its application in lossy image compression.
16. Explain the process of image compression in MPEG-2.

Unit 4: Audio Compression

1. Write a short note on Digital Audio.
2. Write a short note on μ- law companding.
3. Write a short note on A- law companding.
4. What is lossy sound compression?
5. Write down MPEG standards for Audio Compression.
6. Explain the MPEG Audio Standards?
7. Explain Frequency domain Coding?
8. Explain the principle of working of MP-3 audio compression standard?
9. Explain the basic principal of Digital Audio Compression?
10. Define Digital Audio and explain its generation?
11. Define Sound and Analog Audio.
12. Explain the principle of Audio Compression.
13. State the advantage of Digital Audio.
14. Discus Frequency Domain Coding.
15. Explain the format of compressed data.

Unit 5: Conventional Encryption

1. What are the Security goals of cryptography system?
2. What are active and passive attacks?
3. Classify the different type of security attack and explain them with example?
4. Explain the working of DES with the help of block diagram.
5. Give an example of block cipher.
6. Give an example of Stream cipher.
7. Explain the working of triple DES with two keys.
8. Explain the working of triple DES with three keys.
9. Explain the term Key distribution.
10. Write a short note on S-box Design.
11. Explain the principle of Block Cipher.
12. What is caeser cipher?
13. Explain International Data Encryption algorithm.