

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2023

B.Tech-I Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 18B1WCI532

MAX. MARKS: 25

COURSE NAME: Data Compression

COURSE INSTRUCTORS: Dr. Amit Kumar Jakhar

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q1. Consider the following probabilities and encode the sequence 1321
CO1 with the help of the most suitable approach and find out the encoding
sequence that the encoder will transmit to the decoder: 7
 $P(a_1)=0.8; P(a_2)=0.02; P(a_3)=0.18.$

Q2. A source emits letters from an alphabet $A = \{a_1, a_2, a_3, a_4, a_5\}$ with
CO1 probabilities: 6
 $P(a_1)=0.15; P(a_2)=0.04; P(a_3)=0.26; P(a_4)=0.05; P(a_5)=0.50;$
a) Calculate the entropy of this source.
b) Find the minimum variance Huffman code for this source.
c) Find the average length of the code in (b) and its redundancy

Q4 Encode the following sequence with LZ78 and show the
CO2 dictionary representation of all the entries: 6
r, a, t, a, t, a, t, a, t, b, a, b, r, a, t, b, a, t, b, a, b, r, a, t

Index	Entry
1	a
2	b
3	t

Q5 Discuss the followings: 3*2
CO2 a) Generation of a Binary code for arithmetic coding for the given
probabilities: $P(a_1)=0.5; P(a_2)=0.25; P(a_3)=P(a_4)=0.125.$
b) Differentiate the static and dynamic dictionary techniques with
examples.