

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-Dec 2024

B.Tech-V Semester (CSE/IT)

COURSE CODE (CREDITS): 18B1WCI532 (2)

MAX. MARKS: 35

COURSE NAME: DATA COMPRESSION

COURSE INSTRUCTORS: Dr. Praveen Modi

MAX. TIME: 02:00 Hr

*Note: All questions are compulsory. Marks are indicated against each question in square brackets. Write the answer of the question belonging to the same part in the same order.*

Q.No	Question	CO	Marks																	
Q1.	(a) How many bits in the run length encoding using $k = 3$ bits for the following message? "000011000011000001110011000110101010011"	1	3																	
	(b) What will be the closest codeword for the training vector (3,5,6,9) and the code words are $C_1(2,1,4,3)$ , $C_2(5,4,3,6)$ , $C_3(0,3,7,4)$ , $C_4(1,10,0,1)$ ?	5	2																	
	(c) Find the entropy for $P(a) = 0.2$ , $P(b) = 0.22$ , $P(c) = 0.25$ , $P(d) = 0.33$ ?	2	2																	
Q2	(a) Find the decoded message using BWT method for "INDAI" and index = 3?	3	2																	
	(b) Find the arithmetic tag code for message "india", if $P(a) = 0.1$ , $P(d) = 0.2$ , $P(i) = 0.3$ , $P(n) = 0.4$ ?	3	5																	
Q3	(a) Initially there are two code words chosen $C(0) = 2$ , $C(1) = 5$ for the following pixel distribution. Assume that $\epsilon = 0$ , Distortion (D) = 250, $X[0] = [0, 2]$ , and $X[1] = [3, 7]$ . What will be the final code words using llyod algo. up to two steps?	6	5																	
	(b) Using the above output, find the compression ratio for the following pixel distribution in an image?	6	2																	
Q4	(a) Construct the K-DD tree in 2-d plane for the following sequence insertion	6	(3+2)																	
	<table border="1"> <tr> <td>X</td> <td>6</td> <td>7</td> <td>2</td> <td>3</td> <td>4</td> <td>8</td> <td>5</td> <td>1</td> <td>9</td> </tr> <tr> <td>Y</td> <td>2</td> <td>1</td> <td>9</td> <td>6</td> <td>8</td> <td>4</td> <td>3</td> <td>5</td> <td>5</td> </tr> </table>			X	6	7	2	3	4	8	5	1	9	Y	2	1	9	6	8	4
X	6	7	2	3	4	8	5	1	9											
Y	2	1	9	6	8	4	3	5	5											

	of nodes. Show the partition of points in 2-d Plane? (b) For the above part, Find the closest code word to the (6, 3)?	4	2
Q5	(a) What is the worst case behavior of LZ77, LZ78 & LZW method? (b) What will be encoded string using LZW method for following message? "wabba#wabba#wabba#wabba#wabba"	5 5	3 4

JUIT TEST-3 EXAMINATION- DEC 2024