VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

School of Electronics Engineering
Winter Sem 2023-2024
Continuous Assessment Test - II
BECE313L – Information Theory and Coding

B.Tech (ECE) **SLOT: A2** **Marks: 50**

Q. No	Answer All Questions	Marks	CO	BL
1	A long sequence of symbols generated from a source is shown in Table1. Table 1 a) Assign a minimum and maximum Huffman code word to the above symbols. b) Calculate the variance, Coding efficiency, and redundancy.	10	CO3	L3
2	Suppose source is generating four symbols {B, C, A, D} with probabilities {0.3, 0.1, 0.2, 0.4}. Encode the message given below by applying arithmetic encoding techniques. **DBACD**	10	CO3	L3
3	Assume the source is generating 26 lower case English alphabets. Apply Adaptive Huffman Encoding algorithm for the following message. **future**	10	CO3	L3
4	The initial dictionary of LZW coding is given below in Table 2 Table 2 Encode the following message sequence: **abcd@aaaabbb@ccd@ccd@ddd@aaad**	10	CO3	L2

Symbol	Occurrences
A	996
B	2497
C	3003
D	2017
E	2497

Index	Word /Alphabets
1	a
2	c
3	d
4	b
5	@

5	For a systematic linear block code, the parity check digits are represented by $C_4 = d_1 \oplus d_2 \oplus d_3$ $C_5 = d_1 \oplus d_2$ $C_6 = d_1 \oplus d_3$ (a) Construct the generator matrix and estimate the code rate. (b) Construct the encoder circuit, syndrome calculator circuit and also decoder circuit. (c) Given a received message R = [0 0 0 1 1 0] find the syndrome vector and corrected code word.	**10**	**CO5**	**L3**