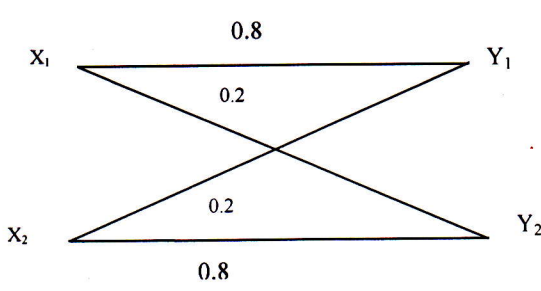


Note: - Attempt any 5 question. All questions carry equal marks.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs																						
1.	Construct a Huffman coding tree for the following message and also its calculate code efficiency. <table border="1" style="margin-left: 20px;"> <tr> <td>Message</td> <td>M1</td> <td>M2</td> <td>M3</td> <td>M4</td> <td>M5</td> <td>M6</td> <td>M7</td> <td>M8</td> <td>M9</td> <td>M10</td> </tr> <tr> <td>Probability</td> <td>0.2</td> <td>0.18</td> <td>0.12</td> <td>0.1</td> <td>0.1</td> <td>0.08</td> <td>0.06</td> <td>0.06</td> <td>0.06</td> <td>0.4</td> </tr> </table>	Message	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	Probability	0.2	0.18	0.12	0.1	0.1	0.08	0.06	0.06	0.06	0.4	[8]	Apply	CO1
Message	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10																
Probability	0.2	0.18	0.12	0.1	0.1	0.08	0.06	0.06	0.06	0.4																
2.	Apply the Shannon-fano coding procedure for the following message ensemble and determine the average length and efficiency of the code system <table border="1" style="margin-left: 20px;"> <tr> <td>Message</td> <td>M1</td> <td>M2</td> <td>M3</td> <td>M4</td> <td>M5</td> </tr> <tr> <td>Probability</td> <td>0.3</td> <td>0.1</td> <td>0.4</td> <td>0.08</td> <td>0.12</td> </tr> </table>	Message	M1	M2	M3	M4	M5	Probability	0.3	0.1	0.4	0.08	0.12	[8]	Apply	CO1										
Message	M1	M2	M3	M4	M5																					
Probability	0.3	0.1	0.4	0.08	0.12																					
3.	. The channel matrix is given by $P(X, Y) = \begin{bmatrix} 2/3 & 1/3 \\ 1/10 & 9/10 \end{bmatrix}$	[8]	Apply	CO1																						
	Determine $H(X)$, $H(X/Y)$, $H(Y/X)$ and mutual information $I(X;Y)$.																									
	Find the mutual information and channel capacity of the channel shown in figure below Given : $p(x_1)=0.6$, $p(x_2)=0.4$. Calculate $H(X)$, $H(Y)$, $H(Y/X)$ and $I(X;Y)$																									
4.		[8]	Apply	CO2																						
5.	A channel has a BW of 5KHz and a signal to noise power is 63. Determine the BW needed if the S/N power ratio is reduced to 31. What will be the signal power required if the channel bandwidth is reduced to 3KHz?	[8]	Apply	CO2																						
6.	State and Prove Shannon Hartley theorem.	[8]	Remember	CO2																						



Shri Shankaracharya Institute of Professional Management & Technology

Department of Electronics and Telecommunication Engineering

Class Test – I Session- Jan – June, 2022 Month- April

Sem- ET&T 6th Subject – AI and Machine Learning - C000630(028)

Time Allowed: 2 hrs Max Marks: 40

Note: - All the questions are compulsory. All questions carry equal marks.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs																										
1.	Explain the following terms with example: 1. Mean 2. Median 3. Mode 4. Central Limit Theorem	[10]	Understanding	CO5																										
2.	Define Machine Learning. Also explain what is training dataset and test dataset in machine learning model and in what ratio the training and test datasets are divided.	[10]	Understanding	CO5																										
3.	What are the different types of machine learning algorithm. Explain each of them in detail.	[10]	Understanding	CO5																										
4.	Design a linear regression model to predict the revenue of a hotel. The dataset is stored in a file Hotel.csv. The dataset is shown below: <table border="1"><thead><tr><th>Revenue</th><th>PercentOccupancy</th></tr></thead><tbody><tr><td>514.44</td><td>65.7</td></tr><tr><td>463.12</td><td>61.1</td></tr><tr><td>598.18</td><td>78.2</td></tr><tr><td>454.92</td><td>65.4</td></tr><tr><td>453.8</td><td>63.5</td></tr><tr><td>502.23</td><td>70.6</td></tr><tr><td>626.26</td><td>81.2</td></tr><tr><td>498.7</td><td>72</td></tr><tr><td>514.46</td><td>72.9</td></tr><tr><td>623.29</td><td>81.7</td></tr><tr><td>454.77</td><td>62.1</td></tr><tr><td>385.57</td><td>53.4</td></tr></tbody></table>	Revenue	PercentOccupancy	514.44	65.7	463.12	61.1	598.18	78.2	454.92	65.4	453.8	63.5	502.23	70.6	626.26	81.2	498.7	72	514.46	72.9	623.29	81.7	454.77	62.1	385.57	53.4	[10]	Apply	CO5
Revenue	PercentOccupancy																													
514.44	65.7																													
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Note: - Attempt any 5 question. All questions carry equal marks.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	For the given sequence $x(n) = 2^n$ and $N = 8$, find $X(K)$ using DIT FFT algorithm	[8]	Apply	CO1
2.	Compute linear and circular convolution of the two sequences $x_1(n) = \{1,1,2,2\}$ and $x_2(n) = \{1,2,3,4\}$	[8]	Apply	CO1
3.	Explain DFT and DTFT. calculate DFT for the input signal $x(n) = \{0,1,2,3\}$.	[8]	Apply	CO1
4.	Find the response of FIR filter with impulse response $h(n) = \{1,2,4\}$ to the input sequence $x(n) = \{1,2\}$ using periodic convolution.	[8]	Apply	CO1
5.	Determine IDFT of $X(K) = \{3, (2+j), 1, (2-j)\}$	[8]	Apply	CO1
6.	Explain Properties of DFT.	[8]	Understanding	CO2
7.	(a) Find the DTFT of the following finite duration sequence of length L $x(n) = \begin{cases} A, & \text{for } 0 \leq n \leq L-1 \\ 0, & \text{otherwise} \end{cases}$ (b) Also, find the inverse DTFT to verify $x(n)$ for $L=3$ and $A=1V$.	[8]	Apply	CO2

Note: - Attempt any 5 question. All questions carry equal marks.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
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Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics & Telecommunication
Class Test – I Session- Jan June 2022 Month- April
Sem- ET&T 6th Subject- Antennas & Wave Propagation Code- C028612(28)
Time Allowed: 2 hrs Max Marks: 40

Note: - Attempt any 5 question. All questions carry equal marks.

Q.NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Define Waveguides? Explain Different types of Waveguide.	[8]	Understanding	CO1
2.	What are the Modes of Propagation in Waveguide?	[8]	Understanding	CO1
3.	Derive the Wave Equation for Two Parallel Plate Waveguides.	[8]	Apply	CO1
4.	Explain Ground wave, Sky wave & Space wave Communication.	[8]	Understanding	CO2
5.	What are the Limitation of Transmission line? How it overcome by waveguide	[8]	Understanding Apply	CO1



Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics & Telecommunication
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5.	What are the Limitation of Transmission line? How it overcome by waveguide	[8]	Understanding Apply	CO1

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering

Class Test – I , Month- April 2022

Sem- ET&T 6th Subject- VLSI Design-C028611(028)

Time Allowed: 2 hrs Max Marks: 40

*NOTE : (1) Attempt any Five Questions.
 (2) Attempt question in serial order.*

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Explain Types of Programming.	[8]	Understanding	
2.	Write a program for (16X1) Multiplexer	[8]	Apply	
3.	Write a program for BCD adder.	[8]	Apply	
4.	Write a program for 4-bit Full adder	[8]	Apply	
5.	Write a program representing different types of programming style.	[8]	Apply	
6.	Explain the use of HDL in Embedded system design.	[8]	Understanding	

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering

Class Test – I , Month- April 2022

Sem- ET&T 6th Subject- VLSI Design-C028611(028)

Time Allowed: 2 hrs Max Marks: 40

*NOTE : (1) Attempt any Five Questions.
 (2) Attempt question in serial order.*

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Explain Types of Programming.	[8]	Understanding	
2.	Write a program for (16X1) Multiplexer	[8]	Apply	
3.	Write a program for BCD adder.	[8]	Apply	
4.	Write a program for 4-bit Full adder	[8]	Apply	
5.	Write a program representing different types of programming style.	[8]	Apply	
6.	Explain the use of HDL in Embedded system design.	[8]	Understanding	