Shri Shankaracharya Institute of Professional Management & Technology, Raipur (C.G)

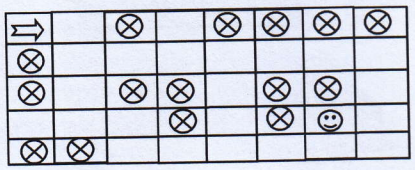
Department of Electronics and Telecommunication Engineering

Class Test – II Session- Jan. – July, 2023 Month- June

Sem- ET&T 6th Sem Subject- AIML - C000629(028)

Time Allowed: 2 hrs. Max Marks: 40

Note: - ***Attempt all questions.***

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	What are the different types of clustering algorithms used in Machine learning? Explain each type briefly.	[8]	Remembering	CO1
2.	Explain the implementation of Fuzzy clustering, Hill climbing and A*?	[8]	Remembering	CO1
3.	What is the objective of the K-means algorithm? Explain with example.	[8]	Understanding	CO1
4.	Solve the problem by using any method to find the shortest path, also write the name of algorithm used to solve the problem. (To reach the smiley in the shortest run, by avoiding obstacles.) also justify the result. 	[6]	Understanding	CO2
5.	What is AI? Discuss about the agents, structure and environments for AI problems solving.	[4]	Remembering	CO2
6.	How Un-supervised learning works?	[4]	Understanding	CO1
7.	Who is the father of AI?	[2]	Remembering	CO2

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering
Class Test – II , Month- June2023
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 Photolithography. Include detailed diagram and description.	[8]	Understanding	4
2.	Write a program for FSM detecting consecutive three 1's and three 0's	[8]	Apply	5
3.	Write a program for universal register.	[8]	Apply	5
4.	Write a program for up/down counter	[8]	Apply	5
5.	Draw Layout diagram of NOT gate NAND gate	[8]	Apply	4
6.	Describe Layout Design rules	[8]	Understanding	4

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Department of Electronics and Telecommunication Engineering
Class Test – II , Month- June2023
Sem- ET&T 6th Subject- VLSI Design (C028611(028)

Time Allowed: 2 hrs Max Marks: 40

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Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics & Telecommunication
Class Test – II Session- Jan June 2023 Month- June
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 gain, Directive Gain, Power gain and Directivity of Antenna	[8]	Understanding	CO3
2.	Design a four element broadside array of λ/2 spacing between elements. The pattern is to be optimum with a side lobe level 19.1 db down the main lobe maximum.	[8]	Apply	CO4
3.	Deduce expression for the radiation pattern of array two point source with equal magnitude & Phase. And also the direction of maxima, minima & half power point	[8]	Apply	CO2
4.	State & Explain Reciprocity Theorem as applied to Antenna	[8]	Understanding	CO3
5.	Explain: (1) Beverage Anteena (2) V Antenna	[8]	Understanding	CO5

"Teachers can open the door, but you must enter it yourself."

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics & Telecommunication
Class Test – II Session- Jan June 2023 Month- June
Sem- ET&T 6th Subject- Antennas & Wave Propagation Code- C028612(28)
Time Allowed: 2 hrs Max Marks: 40

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Shri Shankaracharya Institute of Professional Management & Technology

Department of Electronics andTelecommunication

Class Test – II Session- Jan.– June 2023 Month- June

Sem- ET 6th Subject- Information Theory and Coding C028631(028)

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.	The Parity Check matrix of (7,4) linear code is as follows: $H=\begin{bmatrix}1&1&1&0&1&0&0\\1&1&0&1&0&1&1\\1&0&1&1&0&0&1\end{bmatrix}$ Calculate the syndrome vector for single bit errors.	[8]	Understand	CO3
2.	State and Prove Shannon Hartley theorem. Also show the channel capacity of an ideal AWGN channel with infinite bandwidth is given by $C_\infty = 1.44\frac{P}{N0}$ Where P is the average signal power and No/2 is the power spectral density of white Gaussian noise	[8]	Apply	CO3
3.	For a (6,3) linear block code the coefficient matrix [p] is as follows: $P=\begin{bmatrix}0&1&1\\1&0&1\\1&1&0\end{bmatrix}$ The received code words at the receiver are i) 0001110 ii) 111011 Check whether they are correct or contain errors.	[8]	Understand	CO3
4.	For a systematic linear block code, the three parity check digits , C_4, C_5 , C_6 are given by $C_4 = d_1 + d_2 + d_3$ $C_5 = d_1 + d_2$ $C_6 = d_1 + d_3$ i) Construct generator matrix ii) Construct code generated by this matrix iii) Determine error correcting capability iv) Prepare suitable decoding table	[8]	Apply	CO3
5.	For a (7,4) cyclic code , find out the generator matrix if $G(D)= 1+D+D^3$	[8]	Apply	CO4
6.	Explain Viteri decoding algorithm with Trellis diagram along with an example.	[8]	Apply	CO5

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering
Class Test – II Session- Jan. – June, 2023 Month- June
Sem- ET&T 6th Subject- Digital Signal Processing - C028613(028)
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.	Determine the direct Forms I and II realizations for a third-order HR transfer function. $H(z) = \frac{028z^2+0.319z+0.04}{0.5z^3+0.3z^2+0.17z-0.2}$	[8]	Apply	CO2
2.	An LTI system is described by the equation $y(n) - \frac{1}{4}y(n-1) - \frac{1}{8}y(n-2) = x(n) = +3x(n-1) + 2x(n-2)$. Determine the cascade realization structure of the system.	[8]	Apply	CO2
3.	Realization the given system in and parallel forms. $H(z) = \frac{1\frac{1}{2}z^{-1}}{\left(1 - z^{-1} + \frac{1}{4}z^{-2}\right)\left(1 - z^{-1} + \frac{1}{2}z^{-2}\right)}$	[8]	Apply	CO2
4.	The desired response of a low-pass filter is $H_d(e^{j\omega}) = \begin{cases} e^{-j\omega}, & -3x/4 \le \omega \le 3x/4 \\ 0, & 3x/4 < \lvert\omega\rvert \le x \end{cases}$ Determine H($e^{j\omega}$) $for\ M = 7\ using\ a\ Hamming\ window.$	[8]	Apply	CO3
5.	A law=pass filter is to be desingned with the following desired frequency response $H_d(e^{j\omega}) = \begin{cases} e^{-j2\omega}, & -\pi/4 \le \omega \le \pi/4 \\ 0, & \pi/4 < \lvert\omega\rvert \le \pi \end{cases}$ Determine the filter coefficients $h_d(n)$ if the window function is defind as $w(n) = \begin{cases} 1, & 0 \le n \le 4 \\ 0, & \text{otherwise} \end{cases}$ Also, determine the frequency response $H_d(e^{j\omega})$ of the designed filter.	[8]	Analysis	CO3
6.	A low=pass filter gas the desired response as given below $H_d(e^{j\omega}) = \begin{cases} e^{-j3\omega}, & 0 \le \omega < \frac{\pi}{2} \\ 0, & \frac{\pi}{2} \le \omega \le \pi \end{cases}$ Determine the filter coefficients h(n) for M=7, using type-Ifrequency sampling technique.	[8]	Analysis	CO3