



Shri Shankaracharya Institute of Professional Management & Technology

Department of Information Technology

Class Test – I Session- Jul – Dec 2022 Month- December

Sem- IT 5th, Subject- Artificial Intelligence and Machine Learning, Code- C033511(033)

Time Allowed: 2 hrs Max Marks: 40

Note: - All Questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs																								
A.	Solve Cryptarithmic Problem DONALD + GERALD = ROBERT	[8]	Applying	CO1																								
B.	Solve following 8-puzzle problem using A* algorithm. <table border="1" style="display: inline-table; margin-right: 20px;"><thead><tr><th colspan="3">Initial State</th></tr></thead><tbody><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>8</td><td></td><td>4</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></tbody></table> <table border="1" style="display: inline-table;"><thead><tr><th colspan="3">Goal State</th></tr></thead><tbody><tr><td>2</td><td>8</td><td>1</td></tr><tr><td></td><td>4</td><td>3</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></tbody></table>	Initial State			1	2	3	8		4	7	6	5	Goal State			2	8	1		4	3	7	6	5	[8]	Applying	CO1
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C.	What are various techniques of knowledge representation. Provide example for each of them.	[8]	Applying	CO2																								
D.	Provide CD representation of the following: a. Yesterday, John hit his little dog. b. While going home I see a frog. c. John wants it but he doesn't realize it. d. John hit Mary by throwing a stick at her. e. John threw a rock at Sam.	[1] [1] [2] [3] [3]	Analyze	CO2																								
E.	In what way searching is possible through Hill Climbing? Take example to justify your answer.	[6]	Understanding	CO1																								

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Management & Technology**

Department of Information Technology

CT – I Session- July – Dec 2022 Month–December

Sem-B.tech IT 5th

Subject-Theory of computation Code- C033512(033)

Max Marks: 40

Time Allowed: 2 hrs.

Note: -*Solve any five question.*



Q. N.	Questions	Marks	Levels of Bloom's taxonomy	COs																													
1.	1(a) Design an automata for a regular language which is having a and b as input and accept even number of a's. 1(b) convert above automata to regular expression. Elaborate finite automata as language translator and convert following mela machine to moore machine.	[8]	Applying	CO2																													
2.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Present State</th> <th colspan="4">Next State</th> </tr> <tr> <th>State</th> <th>O/P</th> <th>State</th> <th>O/P</th> </tr> </thead> <tbody> <tr> <td>q₁</td> <td>q₁</td> <td>1</td> <td>q₂</td> <td>0</td> </tr> <tr> <td>q₂</td> <td>q₄</td> <td>1</td> <td>q₄</td> <td>1</td> </tr> <tr> <td>q₃</td> <td>q₂</td> <td>1</td> <td>q₃</td> <td>1</td> </tr> <tr> <td>q₄</td> <td>q₃</td> <td>0</td> <td>q₁</td> <td>1</td> </tr> </tbody> </table>	Present State	Next State				State	O/P	State	O/P	q ₁	q ₁	1	q ₂	0	q ₂	q ₄	1	q ₄	1	q ₃	q ₂	1	q ₃	1	q ₄	q ₃	0	q ₁	1	[8]	Applying	CO1
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3	Elaborate Closure properties of Regular language with example.	[8]	Understanding	CO2																													

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CT – I Session- July – Dec 2022 Month–December

Sem-B.tech IT 5th

Subject-Theory of computation Code- C033512(033)

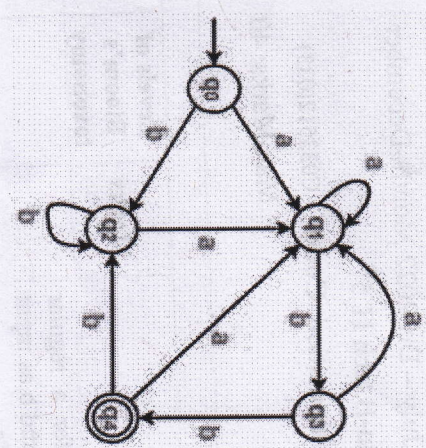
Max Marks: 40

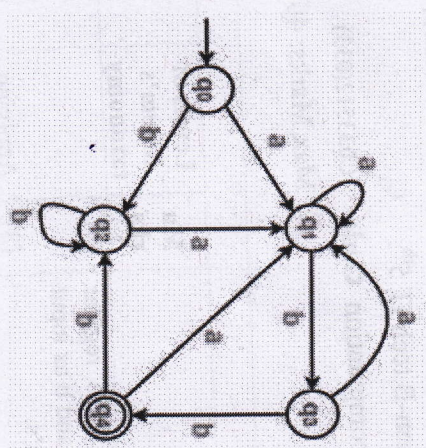
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3	Elaborate Closure properties of Regular language with example.	[8]	Understanding	CO2																													

<p>Consider the following DFA & Minimize it</p> 	<p>[8]</p> <p>Applying</p> <p>CO1</p>
<p>Design finite automata which accepts a and b as input symbol and accepts following language</p> <ol style="list-style-type: none"> L1= regular language which accept length of $n\%3$ L2= regular language accepts odd number of a's 	<p>[8]</p> <p>Applying</p> <p>CO1</p>

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Shri Shankaracharya Institute of Professional Management & Technology
Department of Information Technology
Class Test – I , Month- December
Sem- IT 5th Subject- Principles of Communication Systems- C033513(033)

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.	State and prove sampling theorem for low pass signal	[8]	Understanding	CO3
2.	i. What do you mean by Quantization? ii. Derive an expression for Mean square value of quantization error for PCM	[8]	Applying	CO3
3.	Compare: PAM, PDM, PPM	[8]	Understanding	CO3
4.	Explain Delta Modulation along with the waveform and Block diagram. Also explain types of noises in DM.	[8]	Understanding	CO3
5.	Explain DPSK modulation and Demodulation with the help of block diagram and Transmit the data 1011011 using 1 as an arbitrary bit and prove that the transmitted data is same as the received data	[8]	Understanding	CO4
6.	Explain ASK modulation and Demodulation with the help of block diagram and waveform.	[8]	Understanding	CO4

Shri Shankaracharya Institute of Professional Management & Technology
Department of Information Technology
Class Test – I , Month- December
Sem- IT 5th Subject- Principles of Communication Systems- C033513(033)

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.	State and prove sampling theorem for low pass signal	[8]	Understanding	CO3
2.	iii. What do you mean by Quantization? iv. Derive an expression for Mean square value of quantization error for PCM	[8]	Applying	CO3
3.	Compare: PAM, PDM, PPM	[8]	Understanding	CO3
4.	Explain Delta Modulation along with the waveform and Block diagram. Also explain types of noises in DM.	[8]	Understanding	CO3
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**Shri Shankaracharya Institute of Professional
Management & Technology, Raipur**
Department of Information Technology

Class Test – I Session- July – Dec 2022 Month – Dec

Sem- 5th Sem Subject- Design and Analysis of Algorithm Code- C033531(033)

Time Allowed: 2 hrs. Max Marks: 40

Note: - Questions 1 is mandatory and Attempt any 3 from Question 2, 3, 4 & 5.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
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Unit-I

1.	Write about time complexity of an algorithm.	[2]	Understand	CO1
2.	Solve the recurrence relation by using State master theorem and solve the given problem using master theorem $T(n) = 4T\left(\frac{n}{2}\right) + n$	[6]	Applying	CO1
3.	Define asymptotic notation? Illustrate its different type with example.	[6]	Understand	CO1
4.	List the characteristics of algorithm. Solve the following recurrence relation by using substitution method $T(n) = T\left(\left\lfloor\frac{n}{2}\right\rfloor\right) + 1$	[6]	Applying	CO1
5.	Define recurrence relation? Solve the following recurrence relation by using recursion tree method $T(n) = 2T\left(\frac{n}{2}\right) + n^2$	[6]	Applying	CO1

Unit-II

1.	Describe divide and conquer strategy?	[2]	Understand	CO2
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Department of Information Technology

Class Test – I Session- July – Dec 2022 Month – Dec

Sem- 5th Sem Subject- Design and Analysis of Algorithm Code- C033531(033)

Time Allowed: 2 hrs. Max Marks: 40

Note: - Questions 1 is mandatory and Attempt any 3 from Question 2, 3, 4 & 5.

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Unit-II

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24/12/22

S-I

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
2.	Use Strassen's algorithm to compute the matrix multiplication $\begin{bmatrix} 1 & 3 \\ 7 & 5 \end{bmatrix} \begin{bmatrix} 6 & 8 \\ 4 & 2 \end{bmatrix}$	[6]	Applying	CO2
3.	Apply the Heap-Sort on the array $A = \{5, 13, 2, 25, 7, 17, 20, 8, 4\}$	[6]	Applying	CO2
4.	Draw the red-black tree resulting from inserting the numbers 5, 10, 15, 25, 20 and 30 into an initially empty red-black tree.	[6]	Applying	CO2
5.	Apply the Quick-Sort technique on the following list: $A = \{4, 5, 1, 7, 8, 9, 2, 88\}$	[6]	Applying	CO2

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