Shri Shankaracharya Institute of Professional Management & Technology
Department of Information Technology

Class Test – I   Session- July – Dec 2023 Month –November

Sem- B. Tech. 5th**Subject-** Artificial Intelligence and Machine **Code-** C033511(033)

Time Allowed: 2 hrs.   Max Marks: 40

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

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Explain State space search in detail. Explain about the concept of Heuristic function with an example in informed search techniques.	[8]	Applying	CO1
2.	Differentiate DFS and BFS algorithm of Blind Search Techniques.	[8]	Understanding	CO1
3.	Describe Artificial Intelligence with its Advantages and Disadvantages. Also list its application area in today's scenario.	[8]	Understanding	CO1
4.	Explain alpha beta cutoff with an example. Explain about its advantages over Minimax search Techniques.	[8]	Applying	CO1
5.	Describe Prolog with its structure in Artificial Intelligence.	[8]	Understanding	CO2
6.	Describe Propositional and Predicate logic in detail. Also explain about the use of WFF in detail.	[8]	Applying	CO2

Shri Shankaracharya Institute of Professional Management & Technology
Department of Information Technology
Class Test – I , Month- November- 2023
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.**

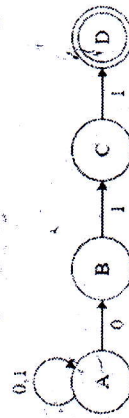| Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	State and prove sampling theorem for low pass signal	[8]	Understanding	CO3
2.	i. What do you mean by Quantization? ii. Derive an expression for Mean square value of quantization error for PCM	[8]	Applying	CO3
3.	Compare: PAM, PDM, PPM	[8]	Understanding	CO3
4.	Explain Delta Modulation along with the waveform and Block diagram. Also explain types of noises in DM.	[8]	Understanding	CO3
5.	Define Modulation. What is the need for modulation. Also Define Modulation Index. Explain the meaning of over modulation, Under-modulation and Critical modulation on the basis of value of modulation index with the help of modulated signal	[8]	Understanding	CO1
6.	Explain Square law modulator and demodulator for generating and detecting AM Signal.	[8]	Understanding	CO1
7	Compare all the AM techniques under following heads a) Bandwidth b) Power saving c) Application d) Transmitter and Receiver complexity e) Frequency spectrum f) Standard equation	[8]	Understanding	CO1

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Class Test – I Session- July-Dec, 2023 Month- November

B.Tech-IT, Sem- 5th Subject- Theory of Computation Code- C033512(033)

Time Allowed: 2 hrs   Max Marks: 40

Note: - Attempt any five Questions.

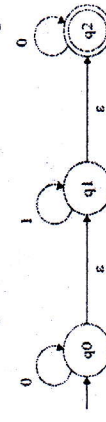| Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	In each part below, design a DFA accepting the indicating language over the alphabet ∑ {0, 1}			
	1. Every string starts and ends with a different symbol.	[8]	Apply	CO1
	2. All the strings start with "ab" and the length is ≃ 2 (mod 4).	[8]	Apply	CO1
2.	Design DFA to accept decimal numbers are divisible by 3. ∑ = { 0,1,2,3,4,5,6,7,8,9} Minimize the given DFA.	[8]	Apply	CO1
3.		[8]	Apply	CO1
4.	Find the equivalent DFA from the following NFA.	[8]	Apply	CO1
5.	Find the equivalent NFA from the following NFA - ε.	[8]	Apply	CO1
6.	Write the Regular Expression to denote language L= {a^n b^m: (n + m) is even}.	[8]	Apply	CO2
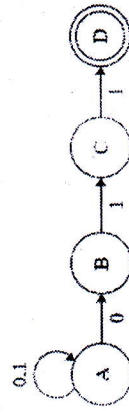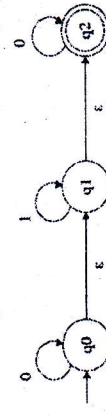
Table for Q.2:

State	Input	
	a	**b**
->q1	q6	q3
q2	q5	q6
q3*	q4	q5
q4*	q3	q2
q5	q2	q1
q6	q1	q4

(Q.4 shows an NFA with states A, B, C, D and transitions 0, 1 with a 0,1 self-loop on A. Q.5 shows an NFA-ε with states q0, q1, q2 and ε transitions.)

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Class Test – I Session - July – Dec 2023 Month – November

Sem- 5th (B.Tech IT) **Subject-** Software Engineering & Project Management

Code- C033514 (033)

Time Allowed: 2 hrs.   Max Marks: 40

Note: -All questions are mandatory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Define software engineering . Explain its characteristics of software in details .	[8]	Understanding	CO1
2.	Elaborate the following model related to software development: 1. Incremental Model 2. Spiral Model	[8]	Understanding	CO1
3.	What is the generic process model in software development ?	[8]	Understanding	CO1
4.	Write down the difference between (i) User and System Requirement (ii) Functional and Non-functional Requirement	[8]	Understanding	CO2
5.	Describe Software Metrics with its characteristics? Also write down the classification, advantages & disadvantages of Software Metrics.	[8]	Understanding	CO2

Shri Shankaracharya Institute of Professional Management & Technology, Raipur

Department of Information Technology

Class Test – I Session- July – Dec 2023 Month – Nov 2023 Code- C033531(033)

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

Time Allowed: 2 hrs.   Max Marks: 40

Note: - Attempt any 5 from Question. Each carry equal marks.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Define asymptotic notation? Explain its different type with example.	[8]	Understand	CO1
2.	Solve the recurrence relation by using the State master theorem and solve the given problem using the master theorem $T(n) = 4T(\frac{n}{2}) + n$	[8]	Applying	CO1
3.	List the characteristics of the algorithm. Solve the following recurrence relation by using the substitution method a. $T(n) = T(\lfloor \frac{n}{2} \rfloor) + 1$ b. $T(n) = 2, \ 0<n<=2$ $2T(\sqrt{n}) + c$	[8]	Applying	CO1
4.	Define recurrence relation. Solve the following recurrence relation by using the recursion tree method a. $T(n) = 2T(\frac{n}{2}) + n^2$ b. $T(n) = T(\frac{n}{3}) + T(\frac{2n}{3}) + n$	[8]	Applying	CO1
5.	Solve the given list of elements using Quick Sort 13, 19, 9, 5, 12, 8, 7, 4, 11, 2, 6, 21	[8]	Applying	CO2
6.	Solve the given list of elements using Merge Sort 15, 10, 5, 20, 30, 25, 40, 35	[8]	Applying	CO2

----- Best of Luck -----