Hall Ticket Number :										

R-19

Code: 19A541T

II B.Tech. II Semester Supplementary Examinations February 2022

Artificial Intelligence

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.		List and discuss the four basic kinds of agents.	14M	CO-1	BL-2
		OR			
2.	a)	Explain the state space representation of Water –Jug problem.	7M	CO-1	BL-4
	b)	Discuss the problem characteristics.	7M	CO-1	BL-2
		UNIT–II			
3.		Describe the following in detail: - a) Hill climbing b) Best first search c) Constraint satisfaction	14M	CO-2	BL-4
		OR			
4.	a)	Develop algorithms for Depth first and Breadth First search algorithms?	7M	CO-2	BL-5
	b)	Explain about A* algorithm in detail	7M	CO-2	BL-4
		UNIT–III			
5.		Consider the following sentences: John likes all kinds of food. Apples are food. Chicken is food. Anything anyone eats and isn't killed by is food. Bill eats peanuts and is still alive. Sue eats everything Bill eats. a) Translate these sentences into formula using predicate logic. b) Prove that John likes peanuts using resolution c) Prove that John likes peanuts using backward chaining d) Convert the formula into clause form.	14M	CO-2	BL-3
		OR			
6.	a)	Differentiate between data, belief, hypothesis, and knowledge. What is tautology? Illustrate with an example.	7M	CO-2	BL-2, 3
	b)	Demonstrate with an example how unification algorithm works.	7M	CO-2	BL-3
		UNIT–IV			
7.	a)	Explain the concept of planning with state space search with an example.	7M	CO-3	BL-4
	b)	Discuss the significance of ontology.	7M	CO-4	BL-2
		OR			
8.		Discuss the role of uncertainty in AI. Explain decision theoretic expert systems in brief	14M	CO-3	BL-2
		UNIT–V			
9.		Illustrate with an example a method for constructing Bayesian networks	14M	CO-5	BL-4
		OR			
10.		Discuss supervised learning and fuzzy logic in detail.	14M	CO-5	BL-4

END

Hall Ticket Number :										

R-19

Code: 19A542T

II B.Tech. II Semester Supplementary Examinations February 2022

Design and Analysis of Algorithms

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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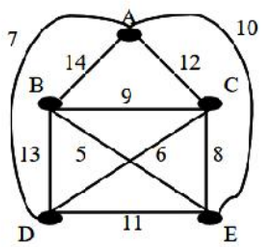
			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	What is the asymptotic lower bound in determining the complexity of an algorithm?	6M	CO1	L2
	b)	Consider the following recurrence T(n)=T(n/3)+T(2n/3)+n Obtain asymptotic bound using recursion tree method.	8M	CO1	L4
		OR			
2.	a)	Differentiate between Ω and ω notations used to represent complexity. Use growth of function concept to explain your answer.	6M	CO1	L4
	b)	Explain the weighted union and collapsing find algorithms with an example?	8M	CO1	L2
		UNIT–II			
3.	a)	Express, in recursive equation form, the time required to search an element from an array of n elements using binary search method.	7M	CO2	L3
	b)	Write Kruskal's algorithm to find a minimum spanning tree of a Graph.	7M	CO2	L3
		OR			
4.	a)	Find an optimal solution to the knapsack instance n=7 objects and the capacity of knapsack m=15. The profits and weights of the objects are (P1, P2, P3, P4, P5, P6, P7) = (10, 5, 15, 7, 6, 18, 3) (W1, W2, W3, W4, W5, W6, W7) = (2, 3, 5, 7, 1, 4, 1)	9M	CO2	L3
	b)	Explain briefly how 'Divide and Conquer' approach is used in Quick Sort.	5M	CO2	L2
		UNIT–III			
5.	a)	Write two characteristics that distinguishes as dynamic algorithm from greedy algorithm.	6M	CO3	L4
	b)	Describe the Dynamic 0/1 Knapsack Problem. Find an optimal solution for the dynamic programming 0/1 knapsack instance for n=3, m=6, profits are (p1, p2,p3) = (1,2,5), weights are (w1,w2,w3)=(2,3,4).	8M	CO3	L4
		OR			
6.		In the following graph find all pairs shortest path using Floyd Warshall algorithm. Give the outline of algorithm and write its time complexity.  	14M	CO3	L4
		UNIT–IV			
7.		Write an algorithm to solve the travelling sales man problem with the LC Branch and Bound	14M	CO4	L2
		OR			
8.		Define sum of subset problem. Apply backtracking to solve the following instance of sum of subset problem: w= (3, 4, 5, 6} and d = 13. Briefly explain the method using a state-space tree.	14M	CO4	L3
		UNIT–V			
9.		Describe NP-completeness and the classes-P, NP and NPC.	14M	CO5	L1
		OR			
10.		State and explain cooks theorem with an example	14M	CO5	L1

END

Hall Ticket Number :										

R-19

Code: 19A543T

II B.Tech. II Semester Supplementary Examinations February 2022

Formal Languages and Automata Theory

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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		Marks	CO	Blooms Level

UNIT–I

1. Consider the following ∈ -NFA

	∈	a	b	c
→p	ø	{p}	{q}	{r}
q	{p}	{q}	{r}	ø
(r)	{q}	{r}	ø	{p}

i. Compute the ∈ - closure of each state

ii. Convert the automation to a DFA. 14M CO1 L1,L2

OR

2. Construct the Minimized DFA for the given below DFA.

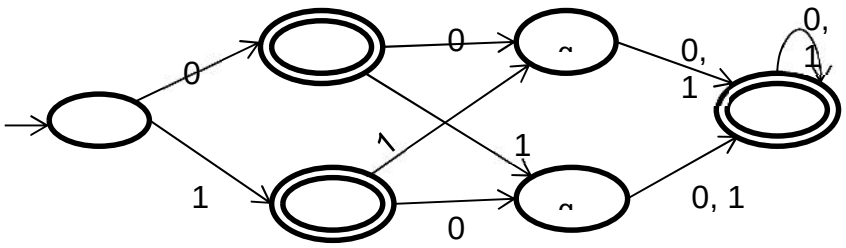

Fig : DFA

14M CO1 L1,L2

UNIT–II

3. Construct DFA for the Regular expression $(0+1)^*(00+11)(0+1)^*$ 14M CO2 L2,L3

OR

4. a) Show that $L = \{a^n b^n c^n / n > 0\}$ is not regular using pumping lemma 8M CO2 L2,L3

b) Illustrate the closure properties of Regular Sets 6M CO2 L2,L3

UNIT–III

5. Construct regular grammar for given DFA.

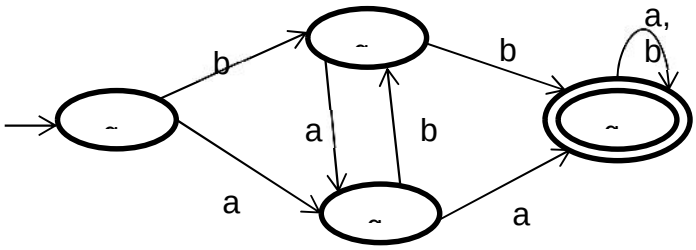

Fig : DFA

14M CO3 L4

OR

6. Convert the following CFG into CNF.

S → aA | a | Bb |cC

A → aB | ϵ

B → a | Aa

C → cCD

D → ddd

14M CO3 L4

UNIT–IV

7. Obtain a PDA to accept the language L (M) = {w | wϵ (a+b)* and n_a (w) = n_b (w)}.

14M CO4 L3

OR

8. Construct CFG for the PDA M = ({q_0, q_1}, {0, 1}, {R, Z_0}, δ, q_0, Z_0, ϕ) and δ is given below:

δ(q_0, 1, Z_0)= (q_0, RZ_0)

δ(q_0, 1, R)= (q_0, RR)

δ(q_0, 0, R)= (q_1, R)

δ(q_1, 0, Z_0)= (q_0, Z_0)

δ(q_0, ϵ, Z0)= (q_0, ϵ)

δ(q_1, 1, R)= (q_1, ϵ)

14M CO4 L3

UNIT–V

9. Design a TM for L = {0^n1^n | n≥1}

14M CO5 L3

OR

10. a) Explain church's hypotheses briefly. 6M CO5 L3

b) Describe in detail about Turing reducibility and Halting Problem. 8M CO5 L3

END

Hall Ticket Number :										

R-19

Code: 19A544T

II B.Tech. II Semester Supplementary Examinations February 2022

Object Oriented Programming using JAVA

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain Object Oriented Paradigm and basic concepts of Object Oriented Programming	7M	CO1	L2
	b)	Define constructor and explain how constructors are different from methods with an example.	7M	CO1	L2
		OR			
2.	a)	Define scope and lifetime of a variable. Discuss various data types used in Java.	7M	CO2	L1
	b)	Explain Overloading methods with a java program.	7M	CO2	L2
		UNIT–II			
3.	a)	Write a program to demonstrate static variables, methods and blocks.	7M	CO2	L3
	b)	Define package. Explain creating, importing, accessing a package with an example.	7M	CO2	L2
		OR			
4.	a)	Explain abstract classes with an example. Compare final and abstract modifiers	7M	CO2	L5
	b)	Define an Interface. Explain the differences between abstract class and interface.	7M	CO2	L2
		UNIT–III			
5.	a)	Explain the ways of creating a thread with an example.	7M	CO3	L2
	b)	Discuss the advantages of Exception handling.	7M	CO3	L2
		OR			
6.	a)	Write a program that creates 3 threads by extending Thread class. First thread displays “Good Morning” every 1 sec, the second thread displays “Hello” every 2 seconds and the third displays “Welcome” every 3 seconds.	7M	CO3	L3
	b)	Explain “throw” and “throws” keywords with a java program.	7M	CO3	L2
		UNIT–IV			
7.	a)	Write a generic method to count the number of elements in a collection that have a specific property (for example, odd integers, prime numbers, palindromes)	7M	CO4	L3
	b)	Explain method references in java.	7M	CO4	
		OR			
8.	a)	How to create Generic Constructors in java? Explain with an example.	7M	CO4	L2
	b)	Define Lambda expression. Explain about Block Lambda expressions.	7M	CO4	L1
		UNIT–V			
9.	a)	What are the main differences between array and collection?	7M	CO5	L3
	b)	Explain StringTokenizer with a java program.	7M	CO5	L2
		OR			
10.	a)	Differentiate ArrayList and LinkedList? Demonstrate LinkedList with a java program.	7M	CO5	L3
	b)	Explain Enumeration ineterface with a java program.	7M	CO5	L2

END

Hall Ticket Number :										

R-19

Code: 19A545T

II B.Tech. II Semester Supplementary Examinations February 2022

Operating Systems

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Define Operating system. Explain different operating system services.	7M	CO1	L1
	b)	Explain briefly system calls with examples.	7M	CO1	L2
		OR		CO1	
2.	a)	How many states a process has? Explain when a process changes the state with a state diagram.	7M	CO1	L4
	b)	Explain about Inter Process communication.	7M	CO1	L2
		UNIT–II			
3.	a)	What are the differences between user-level threads and kernel-level threads?	7M	CO2	L3
	b)	What is critical section problem? Explain about requirements that must satisfy for a solution to the critical-section problem.	7M	CO2	L3
		OR			
4.		Describe dining philosopher problem? Device an algorithm to solve the problem using Semaphores.	14M	CO2	L3
		UNIT–III			
5.	a)	Given memory partitions of 500 KB, 100 KB, 200 KB, 300 KB, and 600 KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB (in order)? Which algorithm makes the most efficient use of memory?	7M	CO3	L5
	b)	What are the necessary conditions for a Deadlock? Discuss.	7M	CO3	L4
		OR			
6.	a)	Write about Characterization of deadlock by resource allocation graph.	7M	CO3	L3
	b)	What is a page fault? Explain the steps involved in handling a page fault with a neat sketch.	7M	CO3	L3
		UNIT–IV			
7.	a)	Discuss in detail the file allocation techniques: Sequential, Indexed and Linked.	7M	CO4	L5
	b)	Explain the following concepts with respect to file: i) File operations ii) File Structures iii) File Types.	7M	CO4	L2
		OR			
8.	a)	Explain the concept of file sharing.	7M	CO4	L2
	b)	Discuss about RAID structure.	7M	CO4	L1
		UNIT–V			
9.	a)	Explain about the goals of protection.	7M	CO5	L2
	b)	Discuss about program threats.	7M	CO5	L1
		OR			
10.	a)	Discuss about the protection of operating system using firewalls.	7M	CO5	L1
	b)	Explain the implementation of security defenses in I/O systems.	7M	CO5	L2

END

Hall Ticket Number :										

R-19

Code: 19AC43T

II B.Tech. II Semester Supplementary Examinations February 2022

Probability and Statistics

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	The following are the number of minutes that a person had to wait for a bus to work on 15 working days. 10 1 13 9 5 9 2 10 3 8 6 17 2 10 15 (i) Find the mean (ii) Find the median.	7M	CO1	L2
	b)	Calculate the mean, median and mode of the following data relating to weight of 120 articles: Weight (in gm): 0-10 10-20 20-30 30-40 40-50 50-60 No. of articles : 14 17 22 26 23 18	7M	CO1	L2
		OR			
2.	a)	Ten people of various heights as under were requested to read the letters on a car at 25 yards distance. The number of letters correctly read is given below: Height (in feet): 5.1 5.3 5.6 5.7 5.8 5.9 5.10 5.11 6.0 6.1 No. of letters : 11 17 19 14 8 15 20 6 8 12 Is there any correlation between heights and visual power?	7M	CO1	L2
	b)	Find the Spearman's rank correlation coefficient to the data: X: 68 64 75 50 64 80 75 40 55 64 Y: 62 58 68 45 81 60 68 48 50 70	7M	CO1	L2
		UNIT–II			
3.	a)	The students in a class are selected at random, one after the other, for an examination. Find the probability *p* that the boys and girls in the class alternate if (i) the class consists of 4 boys and 3 girls. (ii) the class consists of 3 boys and 3 girls.	7M	CO2	L3
	b)	The contents of the three urns are: 1 white, 2 red, 3 green balls; 2 white, 1 red, 1 green balls; 4 white, 5 red, 3 green balls. Two balls are drawn from an urn chosen at random. These are found to be one white and one green. Find the probability that the balls so drawn came from the third urn.	7M	CO2	L3
		OR			
4.	a)	Let the phase error in a tracking device have probability density $f(x)=\begin{cases}\cos x, & 0<x<\frac{®}{2}\\ 0, & elsewhere\end{cases}$ find the probability that the error is (i) between 0 and $\frac{®}{4}$ (ii) greater than $\frac{®}{3}$	7M	CO2	L2
	b)	Find the mean and variance of the probability distribution given by $f(x)=\frac{1}{n},\quad x=1,2,3,\cdots\cdots n$	7M	CO2	L3

UNIT–III

5. a) If the probability in 0.20 that any one person will dislike the taste of a new tooth paste, what is the probability that 5 of 18 randomly selected persons will dislike it. 7M CO3 L3

   b) A source of liquid is known to contain bacteria with the mean number of bacteria per cubic centimeter equal to 3. Ten 1 c.c., test tubes are filled with the liquid. Assuming that Poisson distribution is applicable, calculate the probability that all the test-tubes will show growth i.e., contain at least 1 bacterium each. 7M CO3 L3

OR

6. a) The burning time of an experimental rocket is a random variable having the normal distribution with mean 4.6 seconds and standard deviation 0.04 seconds. What is the probability that this kind of rocket will burn (i) less than 4.66 seconds (ii) more than 4.80 seconds (iii) anywhere from 4.70 to 4.82 seconds. 7M CO3 L3

   b) In a N.D. 31% of the items are under 45 and 8% are over 64. Find the mean and S.D. of the distribution. 7M CO3 L3

UNIT–IV

7. a) A random sample of 400 items is found to have mean 82 and standard deviation of 18. Find the confidence limits for the mean if $\bar{x} = 82$. 7M CO4 L4

   b) If we can assert with 99% that the maximum error is 0.16 and P is 0.3. Find the size of the sample. 7M CO4 L4

OR

8. a) A company claims that its light bulbs are superior to those of its main competitor. If a study showed that n1 = 40 of its bulbs has a mean life time of 647 hours with a standard deviation of 27 hours, While a sample of n2 = 40 bulbs made by its main competitor had a mean lifetime of 638 hours with a standard deviation of 31 hours, does this substantiate the claim at 0.05 level of significance.? 7M CO4 L4

   b) A coin was tossed 400 times and the head turned up 2/6 times. Test the hypothesis that the coin is unbiased at 5% level of significance. 7M CO4 L4

UNIT–V

9. a) A group of 5 patients with medicine A weights: 42, 39, 48, 60 and 41 kg. In the light of the above data, discuss the suggestion that mean weight of the population is 48 kg. Test at 5% level of significance. 7M CO5 L4

   b) The following are the average weekly loses of working hours due to accidents in 10 industrial plants before and after a certain safety program. Use the 5% level of significance to test whether the safety program is effective.

Before	45	73	46	124	33	57	83	34	26	17
After	36	60	44	119	35	51	77	29	24	11

7M CO5 L4

OR

10. a) It is desired to determine whether there is less variability in the silver plating done by company 1 than in that done by company 2. If independent random samples of sizes 12 of the companies work yield S_1=0.035mil and S_2=0.062mil. Test the null hypothesis $\pm_1^2 = \pm_2^2$ against the alternate hypothesis $\pm_1^2 < \pm_2^2$ at 5% level of significance? 7M CO5 L4

    b) 1072 college students were classified according to their intelligence and economic conditions. Test whether intelligence is independent of economic condition.

Economic Condition	INTELLIGENCE			
	Excellent	Good	Mediocre	Dull
Good	48	199	181	82
Not good	81	185	190	106

7M CO5 L4

END

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, RAJAMPET
(AUTONOMOUS)

II B.Tech II Semester **ME & CSE Mandatory Course Supplementary** Examination

19AC45T-Essence of India Traditional Knowledge

H.T. No:-										

R19

Date:-04-03-2022 ***Duration: 2Hrs.***

Answer any five questions from the following. **5X20=100 Marks**

		Marks	Course Outcomes	Bloom's Level
1	Explain the characteristic features which contribute to fundamental unity of India?	20M	CO1	L2
2	Bring out the significance of Vedas, and briefly explain types of four Upvedas?	20M	CO2	L2
3	Briefly sketch the inventions and discoveries of Indian sages in ancient India?	20M	CO3	L1
4	How the characteristic features of Indian way of life show impact in the modern era?	20M	CO1	L2
5	How Traditional practices like Yoga and Pranayama play an important role in the modern world?	20M	CO3	L2
6	Discuss in detail the following significant Indian art forms a) Architecture b) Paintings	20M	CO2	L2
7	Write the relevance of Science and Spirituality in the current Technical world?	20M	CO3	L1
8	Describe different elegant Indian Dance forms which traditionally exist in India?	20M	CO4	L1

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, RAJAMPET
(AUTONOMOUS)

II B.Tech I & II Semesters **CSE & ECE Mandatory Course Supplementary** Examination

19AC37T, 19AC47T-Contitution of India

H.T. No:-										

R19

Date:-05-03-2022 ***Duration: 2Hrs.***

Answer any five questions from the following. **5X20=100 Marks**

		Marks
1	Define the term 'Constitution', and write a detailed note on the 'Preamble' of Indian Constitution.	20M
2	What are 'Fundamental Rights'? What is their importance according to Indian Constitution?	20M
3	Explain the powers and functions of the Supreme Court.	20M
4	How are the powers distributed between the Centre and State in Indian Constitution?	20M
5	Write in detail about the role of Chief Minister and Council of Ministers.	20M
6	What is called 'Local Administration'? Explain about the Panchayat Raj System in India.	20M
7	Write about the roles and responsibilities of the Chief Election Commissioner of India.	20M
8	Write about the National Commission for Backward Classes.	20M