Hall Ticket Number :										

R-19

Code: 19A543T

II B.Tech. II Semester Supplementary Examinations May / June 2024

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	BL
		UNIT–I			
1.	a)	Explain the procedure to convert NFA with € moves to NFA without € moves with suitable example?	6M	CO1	L2
	b)	Design a DFA that accepts the language of all strings with even number of a's and number of b's divisible by 3 over the alphabet ∑ = {a, b}?	8M	CO1	L6
		OR			
2.	a)	What are the difference between NFA and DFA?	4M	CO1	L5
	b)	Explain about Chomsky hierarchy of languages?	10M	CO1	L2
		UNIT–II			
3.	a)	Construct NFA with ε moves for the regular expression? (0+1)*100	6M	CO2	L5
	b)	Prove or disprove that the language L given by L = { $a^m b^n$ / m≠n, m and n are positive integer} is regular?	8M	CO2	L6
		OR			
4.	a)	What is pumping lemma? Write the applications of Pumping Lemma?	4M	CO2	L1
	b)	Construct NFA for the regular expression: 10+(0+11)0*1	10M	CO2	L5
		UNIT–III			
5.	a)	Write and explain about decision problems of Context Free Languages?	4M	CO3	L2
	b)	For the string 'aaabbababbab', Give the Leftmost derivation, Rightmost derivation and Parse tree for the given grammar. Verify the given grammar is ambiguous or not? S→ bA/ aB A→ bAA/aS/a B→ aBB/bS/b	10M	CO3	L3
		OR			
6.	a)	Show that L= {$a^i b^j$/ j=i^2} is not context free language?	6M	CO3	L3
	b)	Convert the following into GNF? S→ AB A→ BS/b B→SA/a	8M	CO3	L6
		UNIT–IV			
7.	a)	Explain the process of constructing PDA from the given grammar?	4M	CO4	L2
	b)	Construct PDA that accepts the CFG G={{S,A,B,C},{a,b,c},P,S} p is defined as, S → aA A → aABC | bB | a B →b C → c	10M	CO4	L5
		OR			
8.	a)	Define the model of Pushdown Automata? What are the different ways of string acceptance in PDA?	4M	CO4	L1
	b)	Construct PDA for the Language L = { $a^n b^m$ | n > m }?	10M	CO4	L5
		UNIT–V			
9.	a)	Explain the properties of Recursively Enumerable Languages?	4M	CO5	L2
	b)	Design a Turing Machine for the language L = {WCW^R | W ϵ $(a+b)^*$ }	10M	CO5	L6
		OR			
10.		Design Turing's Machine to accept the language L={a^n b^n c^n / n≥ 1}. Also give the graphical representation and Instantaneous description (ID) for the import "aabbcc"?	14M	CO5	L6

END

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II B.Tech. II Semester Supplementary Examinations May/June 2024

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	BL
		UNIT–I			
1.		Define multidimensional array? Write a java program for matrix multiplication.	14M	CO1	L2
		OR			
2.	a)	Explain the benefits and applications of OOPs	7M	CO1	L2
	b)	Define Constructor. Explain parameterized constructor.	7M	CO1	L2
		UNIT–II			
3.		How can we implement the multiple inheritance using java? In what way it is different from other type of inheritance? Illustrate with example program	14M	CO2	L2
		OR			
4.	a)	Differentiate between overloading and overriding with examples	7M	CO2	L3
	b)	List the advantages of packages over classes.	7M	CO2	L1
		UNIT–III			
5.	a)	Differentiate between multithreading and multitasking.	7M	CO3	L3
	b)	Write an example program for try and catch block	7M	CO3	L3
		OR			
6.	a)	What is the difference between checked and unchecked exception? Write the code segments for each type.	8M	CO3	L3
	b)	Explain the ways of creating a thread with an example.	6M	CO3	L2
		UNIT–IV			
7.	a)	Explain method references in java.	7M	CO4	L2
	b)	How to create Generic Constructors in java? Explain with an example	7M	CO4	L2
		OR			
8.	a)	What are the three parts of a Lambda Expression? What is the type of Lambda Expression?	7M	CO4	L5
	b)	Write about the generic interfaces.	7M	CO4	L2
		UNIT–V			
9.	a)	Demonstrate Collection algorithms with example program.	7M	CO5	L3
	b)	Breifly explain Map classes.	7M	CO5	L2
		OR			
10.	a)	What are the main differences between array and collection?	7M	CO5	L3
	b)	Explain StringTokenizer with a java program.	7M	CO5	L3

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II B.Tech. II Semester Supplementary Examinations May/June 2024

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	BL
		UNIT–I			
1.	a)	Define a System Call? Elaborate on different System Calls used in operating systems?	10M	CO1	L2
	b)	Explain in brief, How Time-sharing improves response time?	4M	CO1	L2
		OR			
2.	a)	Define a Process? How many states a process has? Explain when a process changes the state with a state diagram.	7M	CO1	L2
	b)	Explain the significance of each field in the Process Control Block.	7M	CO1	L2
		UNIT–II			
3.	a)	Explain the Dining philosopher's problem using monitors?	7M	CO2	L2
	b)	What are the principles of concurrency in an operating system?	7M	CO2	L1
		OR			
4.	a)	What is a thread? Illustrate the differences between single-threaded processes and multi-threaded processes?	8M	CO2	L2
	b)	Differentiate between the thread and process?	6M	CO2	L2
		UNIT–III			
5.	a)	With neat diagram explain Paging Hardware with TLB?	7M	CO3	L2
	b)	Differentiate between internal fragmentation and external fragmentation?	7M	CO3	L4
		OR			
6.	a)	What are the necessary conditions for a Deadlock? Discuss?	7M	CO3	L2
	b)	List and explain the methods for handling Deadlocks?	7M	CO3	L2
		UNIT–IV			
7.	a)	Explain in detail about tree-structured directories? What are its advantages and disadvantages?	7M	CO4	L2
	b)	Explain the functions of file function of a file management system with a diagram?	7M	CO4	L2
		OR			
8.	a)	Explain the following concepts concerning files: i) File Attributes ii) File operations iii) File Structures iv) File Types.	8M	CO4	L1
	b)	Explain the concept of file sharing?	6M	CO4	L2
		UNIT–V			
9.	a)	What is DMA? Illustrate the steps in a DMA Transfer and explains them with a neat diagram?	7M	CO5	L2
	b)	Explain the life cycle of an I/O request?	7M	CO5	L4
		OR			
10.	a)	What is an Interrupt? Discuss in detail the interrupt-driven I/O cycle.	7M	CO5	L2
	b)	How can you transfer I/O requests to hardware operations?	7M	CO5	L4

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II B.Tech. II Semester Supplementary Examinations May/June 2024

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	BL
		UNIT–I			
1.		Write in detail asymptotic notations with examples	14M	CO1	L2
		OR			
2.	a)	Discuss the important problem types during algorithm analysis	7M	CO1	L2
	b)	Write the algorithm for finding the factorial of a given number	7M	CO1	L2
		UNIT–II			
3.		Write Divide and conquer merge sort algorithm.	14M	CO2	L2
		OR			
4.	a)	Explain the average case analysis of Quick sort in detail	10M	CO2	L2
	b)	Write the best case analysis of quick sort	4M	CO2	L2
		UNIT–III			
5.	a)	Discuss the dynamic programming solutions for the problem of reliability design	7M	CO3	L3
	b)	Explain about All pairs shortest path problem	7M	CO3	L2
		OR			
6.		Explain about 0/1 knapsack problem using dynamic programming	14M	CO3	L2
		UNIT–IV			
7.	a)	Explain about FIFO branch and bound method	7M	CO4	L2
	b)	Compare back tracking and branch and bound method	7M	CO4	L4
		OR			
8.	a)	Write a recursive back tracking algorithm for sum of subsets problem	7M	CO4	L4
	b)	Apply branch and bound to 0/1 knapsack and elaborate it.	7M	CO4	L3
		UNIT–V			
9.		How do you prove NP hard and NP Complete? Explain in detail	14M	CO5	L2
		OR			
10.		State and Explain COOKS theorem in detail	14M	CO5	L2

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