R17

Code No: R17A0506

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Formal Language and Automata Theory

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 a)Compare and contrast between NFA and DFA **[6M]**

b)Draw the transition diagram of a FA which accepts all strings of a's and b's in which both the number of b's and a's are even **[8M]**

OR

2 a)Construct Moore for the input from (0+1)* that give residue modulo 4 of input treated as binary **[7M]**

b) Construct a DFA to accept the binary strings divisible by 5 **[7M]**

SECTION-II

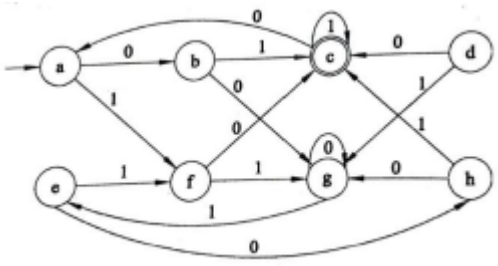
3 a)Explain about the identity rules of Regular Expressions **[7M]**

b)State pumping lemma for regular languages. Prove that the following language $\{a^n \mid n \text{ is a prime number}\}$ is not a regular **[7M]**

OR

4 Find the minimum state automata for the following DFA **[8M]**

a)



b) Design a FA for the following languages **[6M]**

i. (0 *1 *)*

ii. (0+1)* 111*

iii. (0* 11* + 101)

SECTION-III

5 a)Explain in brief about decision properties of context free languages **[7M]**

b) Find CFG for the language $L=\{ a^i b^j c^k \mid i=j\}$. **[7M]**

OR

6 Discuss about the following with example:

a) Context Free Grammar **[4M]**

b) Left Most Derivation **[5M]**

c) Right Most Derivation **[5M]**

SECTION-IV

7	a)Define Pushdown automata and PDA model?	**[7M]**
	b) Discuss Linear Bounded Automata with examples?	**[7M]**
	OR	
8	a)Construct a PDA to accept the following language L= {an b n /n>0}	**[7M]**
	b)Construct the CFG for the PDA M =($\{q_0,q_1\}$, {0,1}, $\{R,Z_0\}$, δ, q_0, Z_0, Φ) and δ is given by $\delta(q_0,1,Z_0)=(q_0,RZ_0)$ $\delta(q_0,1,R)=(q_0,RR)$ $\delta(q_0,0,R)=(q_1,R)$ $\delta(q_1,0, Z0)=(q_0, Z_0)$ $\delta(q_0,\varepsilon, Z_0)=(q_0,\varepsilon)$ $\delta(q_1,1,R)=(q_1,\varepsilon)$	**[7M]**

SECTION-V

9	a)Define Turing Machine. Explain about the Model of Turing Machine?	**[7M]**
	b)Discuss an overview of recursively enumerable language?	**[7M]**
	OR	
10	a)Discuss about Post Correspondence Problem	**[7M]**
	b) Explain undecidability of posts with example?	**[7M]**

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R17

Code No: R17A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Database Management Systems

(IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 a)Define the terms primary key foreign key, and check constraints. How are these expressed in SQL? **[7M]**

b)Describe storage manager component of database system structure? **[7M]**

OR

2 a)What is DBMS? List four significant differences between file processing system and a DBMS? **[7M]**

b)Develop an E-R Diagram for Banking enterprise system? **[7M]**

SECTION-II

3 a)What is the difference between tuple relation calculus and domain relation calculus? **[7M]**

b)Discuss in detail about basic structure of SQL Queries? **[7M]**

OR

4 Consider the SAILOR DATABASE

Sailors (sid:string, sname:string, rating:integer, age:real) Boats (bid:integer, bname:string, color:string) Reserves (sid:integer, bid:integer, day:date) Based on the above schema, write the corresponding SQL queries for the following? **[2M]**

i) Find the colors of boats reserved by Lubber. **[3M]**

ii) Find the names of sailors who have reserved at least one boat. **[3M]**

iii) Find the names of sailors who have reserved a red or green boat. **[3M]**

iv) Find the names of the sailors who have reserved both a Red boat and a Green boat.

v) Find names of sailors who have reserved all boats. **[3M]**

SECTION-III

5 a)Explain 2NF and 3NF Normal forms with examples? **[7M]**

b) Define functional dependency? How can you compute the minimal cover for a set of functional dependencies? Explain it with an example? **[7M]**

OR

6 a)Define BCNF .How does it differ from 3NF **[7M]**

b) What is meant by lossless-join decomposition? Explain. **[7M]**

SECTION-IV

7 a) Explain how Concurrency control can be achieved with locking methods? **[7M]**

b) Discuss on strict, two-phase locking protocol? **[7M]**

OR

8	a)What is Transaction? List and explain the properties of Transaction?	**[7M]**
	b)Elaborate the Timestamp Based Protocols?	**[7M]**

SECTION-V

9	a)Explain in detail B+ tree file organization?	**[7M]**
	b)Explain ARIES algorithm?	**[7M]**

OR

10	a)Explain various Indexes with example?	**[7M]**
	b)Discuss Failure with loss of nonvolatile storage?	**[7M]**

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R17

Code No: R17A0508

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Design and Analysis of Algorithms

(IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1	(a)What are the different mathematical notations used for algorithm analysis	**[7M]**
	(b) In what way a time complexity differs from space complexity.	**[7M]**
	OR	
2	(a)Write Divide – And– Conquer recursive merge sort algorithm and analyze the algorithm for average time complexity.	**[7M]**
	(b) Write an algorithm for collapsing find	**[7M]**

SECTION-II

3	(a)Design an algorithm to sort the given list of elements using Quick Sort incorporating divide and conquer technique. Sort the following list using the same and compute its best case time efficiency: 4, 2, 0, 8, 7, 1, 3, 6.	**[7M]**
	(b) What is the importance of knapsack algorithm in our daily life?	**[7M]**
	OR	
4	Find a solution to the 8-Queens problem using backtracking strategy. Draw the solution space using necessary bounding function.	**[14M]**

SECTION-III

5	(a)Explain how Matrix – chain Multiplication problem can be solved using dynamic programming with suitable example	**[7M]**
	(b) What you mean by dynamic programming.	**[7M]**
	OR	
6	(a)Discuss the time and space complexity of Dynamic Programming traveling sales person algorithm.	**[7M]**
	(b) Define optimal binary search tree with an example.	**[7M]**

SECTION-IV

7	(a)Write an algorithm to determine the Hamiltonian cycle backtracking with an example.	**[7M]**
	(b) Write Control Abstraction of Greedy method.	**[7M]**
	OR	
8	(a)Explain the AND/OR graph problem with an example.	**[7M]**
	(b) Define Backtracking? List the applications of Backtracking.	**[7M]**

SECTION-V

9	(a)Solve the Travelling Salesman problem using branch and bound algorithms.	**[7M]**
	(b) Differentiate between prim's algorithm and krushkals algorithm.	**[7M]**

OR

10 (a)State and prove the Cook's theorem **[7M]**

(b) State the difference between FIFO and LC Branch and Bound algorithms. **[7M]**

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R17

Code No: R17A0051

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Intellectual Property Rights

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 What is Intellectual Property Rights (IPR)? What are the different types of IPR? **[14M]**

OR

2 Explain the agencies responsible for Intellectual Property Registration with any two examples? **[14M]**

SECTION-II

3 What is Trademark? Explain the different types of trademarks with examples. Differentiate between Trademark and design. What is the process of registering a trademark. **[14M]**

OR

4 What is trade secret? Give any famous example of trade secret. Why are trade secrets so significant and what is the negative aspect of trade secret? **[14M]**

SECTION-III

5 Describe Copyright and the works protected under copyright act. Briefly explain the process of obtaining copyright. **[14M]**

OR

6 Explain the key issues related to IP internationally. **[14M]**

SECTION-IV

7 Explain how the cyber crime can control in trademark? **[14M]**

OR

8 Discuss in detail about the management of IP rights. **[14M]**

SECTION-V

9 Discuss new developments in protecting international trademark law. What are they? Explain. **[14M]**

OR

10 Explain the importance of International patent protection for Indian companies. **[14M]**

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Code No: R17A0507 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Java Programming

(IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1	(a) Describe the different types of datatypes used in Java.	**[7M]**
	(b) Write a Program to Convert the temperature in Fahrenheit to Centigrade.	**[7M]**
	OR	
2	(a)How do we implement polymorphism in JAVA? Explain briefly	**[7M]**
	(b)What is an array? How do you declare the array in java? Give examples	**[7M]**

SECTION-II

3	(a) Explain method overriding with a suitable example program.	**[7M]**
	(b) With suitable program segments describe the usage of 'super' keyword.	**[7M]**
	OR	
4	(a) How to design and implement an interface in Java? Give an example	**[7M]**
	(b) Give an example where interface can be used to support multiple inheritance.	**[7M]**

SECTION-III

5	(a) With a suitable Java program explain user-defined exception handling.	**[7M]**
	(b) Write a program to implement a producer and Consumer problem by using multithreading.	**[7M]**
	OR	
6	(a) Differentiate between multiprocessing and multithreading. What is to be done to implement these in a program?	**[7M]**
	(b) Write a program that creates two threads. Fist thread prints the numbers from 1 to 100 and the other thread prints the numbers from 100 to 1.	**[7M]**

SECTION-IV

7	(a) Discuss the four types of JDBC driver with suitable diagrams.	**[7M]**
	(b) Write a program to implement the operations of random access file.	**[7M]**
	OR	
8	(a) Explain the file management using File class.	**[7M]**
	(b) Write a program which stores a list of strings in an ArrayList and then displays the contents of the list.	**[7M]**

SECTION-V

9	(a) What is the significance of layout managers? Discuss briefly various layout managers.	**[7M]**
	(b) Give an overview of JButton class**.**	**[7M]**

OR

10 (a)Write a Java Program to design a Scientific Calculator using AWT. **[7M]**

(b)Write a program to create a frame window that responds to mouse clicks. **[7M]**

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