R18

Code No: R18A0508

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)

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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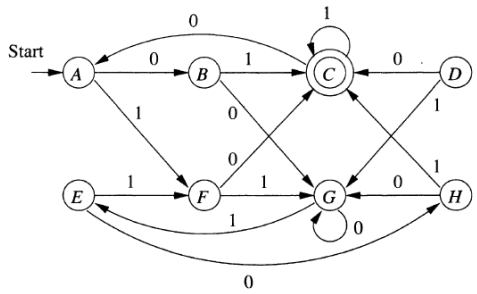
SECTION-I

1 Find the ε-NFA for the language defined over {0,1} where strings beginning with 0 and ending with 1. And convert it into a DFA. **[14M]**

OR

2 Minimize the following DFA **[14M]**



SECTION-II

3 Find the regular expression for the DFA which describes the language defined over {0,1} where strings containing 101 as substring. **[14M]**

OR

4 Construct the transition systems to the following regular expression **[14M]**

i) a*+(ab+a)*

ii) a+(b*+a)*

SECTION-III

5 Consider the following productions **[14M]**

S →aB | bA, A →aS | bAA | a, B →bS | aBB | b.

For the strings aaabbabbba, abababababab find leftmost derivation and rightmost derivations

OR

6 Consider the following productions **[14M]**

S → AB | C

A → aAb | ab

B → cBd | cd
C → aCd | aDd
D → bDc | bc

for the string aabbccdd, aaabbbcd find leftmost derivation and rightmost derivation & parse trees.

SECTION-IV

7 Find the grammar which is in CNF for the following grammar. **[14M]**

S → ABC | BaB,
A → aA | BaC | aaa,
B → bBb | a | D,
C → CA | AC,
D → ε

OR

8 Construct a PDA to accept the language L={ $a^n b a^n$ / n>0} **[14M]**

SECTION-V

9 Construct TM to accept the language L={ $a^n b^n c^n$ / n>0} **[14M]**

OR

10 a) Explain about Universal Turing Machine. **[14M]**

b) Give any two solutions for the following PCP. (w1,w2,w3)=(1,10111,10) and (x1,x2,x3)=(111,10,0)

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R18

Code No: R18A0507

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

(CSE)

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 Explain about Time Complexity and Space complexity with examples of recursive algorithm and non-recursive algorithm. **[14M]**

OR

2 Write the Partition and Quicksort algorithms. Derive the average case time complexity of Quicksort. **[14M]**

SECTION-II

3 How 8-Queen's problem can be solved using Backtracking? Write algorithms and write at least one solution to the 8-Queen's problem. **[14M]**

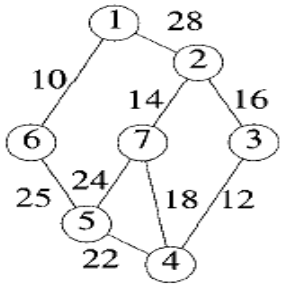
OR

4 a) Write the algorithm to solve Sum of subsets problem. **[7M]**

b) Explain about Bi-connected components. **[7M]**

SECTION-III

5 Define spanning tree. Find the spanning tree for the following graph using Prim's and Kruskal's algorithm. **[14M]**



OR

6 a) Write an algorithm for Job sequencing with deadlines. **[7M]**

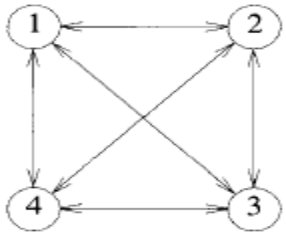
b) Given a set of 'n' jobs each job 'i' has a deadline di such that di>=0 and a Profit pi such that pi>=0. For job 'i' profit pi is earned if and only if it is completed within deadline. Let n = 4 (p1,p2,p3,p4) = (100,10,15,27) and (d1,d2,d3,d4) = (2,1,2,1). Find all feasible solutions. **[7M]**

SECTION-IV

7 Construct an optimal binary search tree for the given instance of the problem. Let n = 4 and (a1, a2, a3, a4) = (do, if, int, while). Let p(l:4) = (3,3,1,1) and q(0:4) = (2,3,1,1,1). The p's and q's have been multiplied by 16 for convenience. **[14M]**

OR

8 Solve the following travelling sales person problem. **[14M]**



$$\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

SECTION-V

9 a) Define NP-hard and NP-complete problems. Draw the commonly believed relation between P, NP, NP-hard and NP-complete problems. **[7M]**

b) State and explain Cook's Theorem. **[7M]**

OR

10 a) Write FIFO Branch and Bound algorithm. **[7M]**

b) Compare FIFO branch bound solution and LC branch and bound solution. **[7M]**

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R18

Code No: R18A0510

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Database Management Systems

(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 Explain the database architecture with a neat diagram. **[14M]**

OR

2 Construct an Entity-Relationship diagram for online shopping systems such as Amazon/Flipkart. Quote your assumptions and list the requirements considered by you for conceptual database design for the above system. **[14M]**

SECTION-II

3 Discuss TRC and DRC with examples. **[14M]**

OR

4 Consider the following schema to write queries in Domain relational calculus: Sailor(sid, sname, age, rating) Boats(bid, bname, bcolor) Reserves(sid,bid,day) **[14M]**

a). Find the boats reserved by sailor with id 567.
b). Find the names of the sailors who reserved 'red' boats.
c). Find the boats which have at least two reservations by different sailors.
d). Find the sum of the rating in sailors.
e). Find the count of the bname.

SECTION-III

5 Explain with examples 4-NF and 3-NF. **[14M]**

OR

6 What is meant by multi-valued dependencies? Give an example. Discuss 5-NF. **[14M]**

SECTION-IV

7 Discuss Timestamp Based Protocols and Validation-Based Protocols. **[14M]**

OR

8 What is Serializability? Explain the types of Serializability. **[14M]**

SECTION-V

9 Briefly explain about failure with loss of non-volatile storage. **[14M]**

OR

10 What is meant by checkpoints? Explain with an example. **[14M]**

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R18

Code No: R18A0061

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Managerial Economics and Financial Analysis

(EEE, ECE, 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 Explain how Managerial economics has roots in Economics and Management. Does it have any links with other subjects? **[14M]**

OR

2 What is Demand forecasting? Explain the factors governing demand forecasting. **[14M]**

SECTION-II

3 Define production Function. Discuss in detail the different types of production functions. **[14M]**

OR

4 You are given the following information about two companies in 2000. **[14M]**

Particulars	Company A	Company B
Sales	Rs.50,00,000	Rs.50,00,000
Fixed Expenses	Rs.12,00,000	Rs.17,00,000
Variable Expenses	Rs.35,00,000	Rs.30,00,000

You are required to Calculate (For Both Companies). a)BEP (in Rs.) b) P/V Ratio c) Margin of safety

SECTION-III

5 Compare and contrast between Perfect competition and Monopoly. **[14M]**

OR

6 Explain the features and evaluation of different forms of business organization. **[14M]**

SECTION-IV

7 What is working capital? Explain the factors that determine the working capital requirements of company? **[14M]**

OR

8 Explain various concepts and conventions of accounting. **[14M]**

SECTION-V

9 A Company has at hand two proposals for consideration. The cost of the proposals in both the cases is Rs. 5, 00,000 each. A discount factor of 12% may be used to evaluate the proposals. Cash inflows after taxes are as under. **[14M]**

Year	Proposals **X**(Rs.)	Proposals **Y**(Rs.)
1	1,50,000	50,000
2	2,00,000	1,50,000
3	2,50,000	2,00,000
4	1,50,000	3,00,000
5	1,00,000	2,00,000

Which one will you recommend under NPV method?

OR

10 How are ratios classified for the purpose of financial analysis? Explain ratios under each category with formulae. **[14M]**

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R18

Code No: R18A0555

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Data Visualization

(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). What are the differences between inferential statistics and descriptive statistics?	**[7M]**
	b). What is data visualization? What are the advantages of data visualization?	**[7M]**
	OR	
2	Why normal probability distribution is important in data visualization? Explain.	**[14M]**

SECTION-II

3	Briefly explain the data manipulation in R with dplyr package. Give an Example.	**[14M]**
	OR	
4	Explain the data visualization in R. Give an example.	**[14M]**

SECTION-III

5	Discuss in detail pandas in python with suitable examples.	**[14M]**
	OR	
6	How to creating and access numpy arrays? Give a suitable example.	**[14M]**

SECTION-IV

7	Explain the Matplotlib Tools in data visualization.	**[14M]**
	OR	
8	What is wafflechart? How to create wafflechart? Give an example.	**[14M]**

SECTION-V

9	Define a seaborn. Why is seaborn useful in data visualization? Explain.	**[14M]**
	OR	
10	How to create a scatter plot in data visualization using seaborn? Explain.	**[14M]**

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R18

Code No: R18A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Java Programming

(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)	Discuss about the need of static variables and static methods in java with examples?	**[7M]**
	b)	Write a java program to demonstrate the uses of **this** keyword?	**[7M]**
		OR	
2	a)	Briefly explain about string comparison functions with examples.	**[7M]**
	b)	What is parameterized constructor? Write a java program to demonstrate the parameterized constructor.	**[7M]**

SECTION-II

3	a)	Define multiple inheritances? Explain why java doesn't support multiple inheritances? How can we achieve multiple inheritances? Explain with an example program.	**[10M]**
	b)	Write the differences between interface and abstract methods in java?	**[4M]**
		OR	
4	a)	Write a java program to implements the multilevel inheritance?	**[7M]**
	b)	What are the advantages of interface? Write a java program to demonstrate how interface is implementing in a class with an example.	**[7M]**

SECTION-III

5	a)	Explain how to handle multiple exceptions in java with an example.	**[8M]**
	b)	Write the differences between multiple processes and multiple threads.	**[6M]**
		OR	
6	a)	Explain the thread lifecycles with a neat sketch.	**[5M]**
	b)	What is thread synchronization? What is purpose of thread synchronization? How many ways we can implement the thread synchronization in java ?	**[9M]**

SECTION-IV

7	a)	What is an ArrayList? Write a java program to add Strings and integers to two different array lists and display them accordingly?	**[10M]**
	b)	Write the advantages and disadvantages of JDBC Type -2 driver?	**[4M]**
		OR	
8	a)	Write a Java program that reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.	**[9M]**
	b)	Explain the need of lambda expressions with an example.	**[5M]**

SECTION-V

9	a)	Write the differences between border layout and grid layout.	**[8M]**
	b)	Explain the following KeyListerner methods.	
		i) keyTyped()	**[2M]**
		ii)keyReleased()	**[2M]**
		iii)keyPressed()	**[2M]**
		OR	
10	a)	Write a java program to demonstrate the keyboard events.	**[8M]**
	b)	Explain the event delegation model in java.	**[6M]**

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