R20

Code No: R20A0507

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2024

Formal Language and Automata Theory

(CSE & CSE-AIML)

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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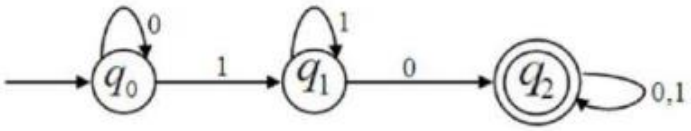
			BCLL	CO(s)	Marks
		SECTION-I			
1	***A***	Design DFA for the following over {a, b} i) All strings containing not more than three a's. ii) All strings that has at least two occurrences of b between any two occurrences of a.	**L3**	**CO-I**	**[7M]**
	B	Explain about central concepts of Automata Theory.	**L2**	**CO-I**	**[7M]**
		OR			
2		Construct the Moore machine to determine residue mod 3 and convert into Mealy machine.	**L3**	**CO-I**	**[14M]**
		SECTION-II			
3	***A***	Convert regular expression (01* +1) to finite automata.	**L3**	**CO-II**	**[7M]**
	B	Explain about Pumping Lemma.	**L2**	**CO-II**	**[7M]**
		OR			
4	***A***	Explain the applications of regular expressions	**L2**	**CO-II**	**[7M]**
	B	Construct the regular expression corresponding to the language accepted by following DFA. 	**L3**	**CO-II**	**[7M]**
		SECTION-III			
5	***A***	Explain the followings with examples. i. Context free grammars ii. Ambiguity in Grammars.	**L2**	**CO-III**	**[7M]**
	B	The following generates prefix expression with operands x,y and operators +,- and *. E→ **+ EE| * EE | - EE | x | y** i. Find leftmost and right most derivations and a derivation tree for the string **+*-xyxy**. ii. Prove that this grammar is unambiguous.	**L3**	**CO-III**	**[7M]**
		OR			
6	***A***	Discuss in detail about leftmost and right most derivation tree with example.	**L2**	**CO-III**	**[7M]**
	B	List and Explain application of context-free grammars.	**L4**	**CO-III**	**[7M]**

SECTION-IV

7	***A***	How to remove the ambiguity from the grammar? Explain with example.	**L3**	**CO-IV**	**[7M]**
	B	Construct CFG without ε – production from the one which is given below S → a | Ab | aBa A → b | ε B → b | A	**L3**	**CO-IV**	**[7M]**
		OR			
8	***A***	Define Chomsky Normal Form (CNF). Convert the following grammar to CNF S→0S0|1S1| ∈	**L3**	**CO-IV**	**[7M]**
	B	Construct PDA from the following CFG S → aAA A → aS|bS|a	**L3**	**CO-IV**	**[7M]**

SECTION-V

9	***A***	Design a Turing Machine to accept L={WCW^R | W is in (a+b)*}.	**L3**	**CO-V**	**[7M]**
	B	Write the properties of recursive and non-recursive enumerable languages.	**L2**	**CO-V**	**[7M]**
		OR			
10	***A***	Define post`s correspondence problem and show that it is undecidable.	**L1**	**CO-V**	**[7M]**
	B	Discuss in detail about P and NP problems.	**L2**	**CO-V**	**[7M]**

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R20

Code No: R20A0508

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2024

Object Oriented Programming through Java

(CSE, IT, CSE-CS, CSE-AIML, CSE-DS, CSE-IOT, B.Tech-AIDS & B.Tech-AIML)

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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			BCLL	CO(s)	Marks
		SECTION-I			
1	***A***	Explain about Recursion in java with an example.	**L1**	**CO-I**	**[7M]**
	B	Write a java program to display total marks of five students using student class and the following attributes: Regno(int), Name(string), Marks in subjects(integer), Total(int). Also find the maximum mark and minimum marks obtained by a student in a particular subject.	**L5**	**CO-I**	**[7M]**
		OR			
2	***A***	Discuss in detail about the features in java.	**L1**	**CO-I**	**[7M]**
	B	Explain about control statements in java with suitable program.	**L1**	**CO-I**	**[7M]**
		SECTION-II			
3	***A***	Briefly explain about the inheritance and its types in java with suitable program.	**L2**	**CO-II**	**[7M]**
	B	Discuss about the inner classes in java with suitable example.	**L2**	**CO-II**	**[7M]**
		OR			
4	***A***	Elaborate the concept of method overloading and method overriding in java with suitable example.	**L2**	**CO-II**	**[7M]**
	B	What is Package? Explain how the creation and execution of a package with detail.	**L4**	**CO-II**	**[7M]**
		SECTION-III			
5	***A***	Discuss about try, catch, and throw, throws and finally keyword in java with an example program.	**L1**	**CO-III**	**[7M]**
	B	Write in detail multithreading concepts in java with example program.	**L2**	**CO-III**	**[7M]**
		OR			
6	***A***	Discuss the fundamental principles and concepts of exception handling in Java which focusing on common exceptions such as NullPointerException, Array IndexOutOfBoundsException, StringIndexOutOfException,ArithmeticException, NumberFormatException and UserdefinedException. Illustrate with examples how each mentioned exception can occur and how programmers can effectively handle them to enhance the robustness of their Java applications.	**L4**	**CO-III**	**[7M]**

	B	Discuss in detail about the various stages of thread life cycle with neat diagram.	**L5**	**CO-III**	**[7M]**
		SECTION-IV			
7	***A***	Write short notes on Java collection framework with example program.	**L1**	**CO-IV**	**[7M]**
	B	Briefly explain the concept of JDBC with a suitable program.	**L2**	**CO-IV**	**[7M]**
		OR			
8	***A***	Explain about java I/O file streams classes with examples	**L1**	**CO-IV**	**[7M]**
	B	Write a java program to demonstrate the concept of file management using File class.	**L3**	**CO-IV**	**[7M]**
		SECTION-V			
9		Explain the different layout managers in Java with example	**L3**	**CO-V**	**[14M]**
		OR			
10	***A***	Discuss the Java GUI components with suitable example.	**L1**	**CO-V**	**[7M]**
	B	Enumerate in detail mouse events with a sample program.	**L2**	**CO-V**	**[7M]**

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R20

Code No: R20A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2024

Database Management Systems

(CSE, IT, CSE-CS, CSE-AIML, CSE-DS, CSE-IOT & B.Tech-AIDS)

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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			BCLL	CO(s)	Marks
		SECTION-I			
1	***A***	What is DBMS? List out the important applications of DBMS in the modern era.	**L3**	**CO-I**	**[7M]**
	B	Differentiate Entity sets and Relationship sets in detail.	**L1**	**CO-I**	**[7M]**
		OR			
2	***A***	Who are the different database users? Explain their interfaces to the database management system.	**L5**	**CO-I**	**[7M]**
	B	Explain the relational model structure in detail.	**L2**	**CO-I**	**[7M]**
		SECTION-II			
3	***A***	What is Tuple Relational Calculus in DBMS, explain.	**L5**	**CO-II**	**[6M]**
	B	Explain the following in SQL a) EXCEPT b) EXIST	**L2**	**CO-II**	**[8M]**
		OR			
4	***A***	What is the role of the selection operation in Relational algebra, explain the syntax with a suitable example.	**L1**	**CO-II**	**[7M]**
	B	Write is the role of triggers in SQL. Explain with simple examples.	**L3**	**CO-II**	**[7M]**
		SECTION-III			
5	***A***	What is the second normal form explain with a suitable example.	**L2**	**CO-III**	**[7M]**
	B	What is Normalization and how to do it in DBMS, explain.	**L4**	**CO-III**	**[7M]**
		OR			
6	***A***	What is partial dependency, explain with an example.	**L2**	**CO-III**	**[7M]**
	B	What is join dependency, explain the statement of the fifth normal form.	**L4**	**CO-III**	**[7M]**
		SECTION-IV			
7	***A***	Explain ACID properties in detail.	**L2**	**CO-IV**	**[7M]**
	B	Explain the concept of multiple granularity with a suitable example.	**L1**	**CO-IV**	**[7M]**
		OR			
8	***A***	Write short notes on lock-based protocols.	**L3**	**CO-IV**	**[7M]**
	B	Why timestamps are used? How many ways timestamps are	**L4**	**CO-IV**	**[7M]**

generated? Discuss the Thomas Write Rule.

SECTION-V

9	***A***	Explain the concept of log-based recovery.	**L4**	**CO-V**	**[7M]**
	B	What is non-volatile storage, explain the concept of failure with loss of non-volatile storage	**L1**	**CO-V**	**[7M]**
		OR			
10	***A***	Explain the checkpoint log-based recovery scheme for recovering the database.	**L3**	**CO-V**	**[7M]**
	B	Write a short note on buffer management in databases.	**L1**	**CO-V**	**[7M]**

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R20

Code No: R20A0510

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2024

Computer Networks

(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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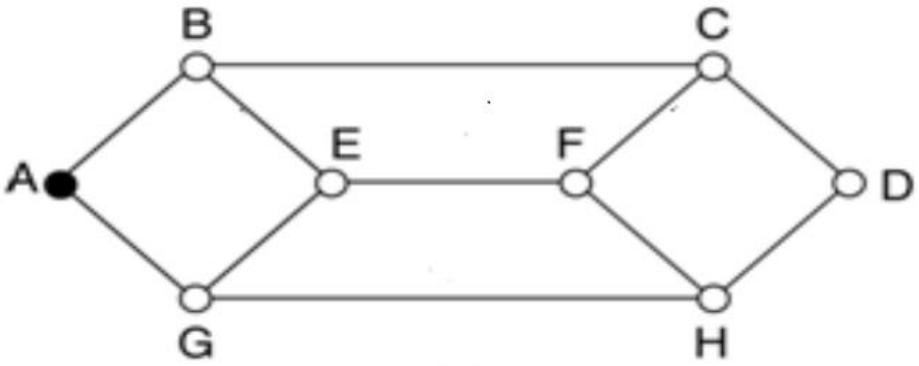
			BCLL	CO(s)	Mark
		SECTION-I			
1	***A***	Explain in detail about OSI reference model..	**L1**	**CO-I**	**[8M]**
	B	Write the advantages of Computer Networks.	**L1**	**CO-I**	**[6M]**
		OR			
2	***A***	Discuss in detail about various types of guided transmission media. List the advantages and disadvantages of each	**L2**	**CO-I**	**[7M]**
	B	Distinguish the differences between OSI and TCP/IP models.	**L2**	**CO-I**	**[7M]**
		SECTION-II			
3	***A***	Calculate the 7-bit Hamming code word received by a receiver is 1011011. Assuming the even parity, state whether the received word is correct or wrong. If wrong locate the bit in the error.	**L3**	**CO-II**	**[7M]**
	B	Discuss stop-and-wait protocol	**L2**	**CO-II**	**[7M]**
		OR			
4	***A***	List various flow control protocols Explain the Go-Back-N protocol with a neat diagram.	**L3**	**CO-II**	**[7M]**
	B	Discuss about CSMA / CD network protocols	**L4**	**CO-II**	**[7M]**
		SECTION-III			
5	***A***	Compare and contrast between IPv4 and IPv6 headers.	**L4**	**CO-III**	**[7M]**
	B	Imagine the following graph.			



L3 **CO-III** **[7M]**

Suppose that it uses Distance Vector Routing as the routing algorithm. If a packet sent by A to D has a maximum hop count of 3, list all the routes it will take. Also, tell how many hops worth of bandwidth it

consumes.

OR

6	***A***	If you were setting up a home network, which private IP address range would you likely use?	**L3**	**CO-III**	**[7M]**
	B	Create a guide explaining the differences and usage scenarios for loopback, link-local, and multicast addresses.	**L5**	**CO-III**	**[7M]**

SECTION-IV

7	***A***	Explain bout connection establishment in TCP protocol.	**L4**	**CO-IV**	**[7M]**
	B	List out the categories of congestion control policies in the transport layer and explain them in detail.	**L4**	**CO-IV**	**[7M]**

OR

8	***A***	Compare the leaky bucket algorithm with the token bucket algorithm for traffic shaping.	**L4**	**CO-IV**	**[7M]**
	B	Write the differences between TCP and UDP	**L3**	**CO-IV**	**[7M]**

SECTION-V

9	***A***	Explain the architecture of an email system, detailing its key components and how they interact to facilitate email communication. Additionally, describe the primary services offered by an email system to its users.	**L2**	**CO-V**	**[7M]**
	B	Design a flowchart illustrating the process of an HTTP request and response cycle.	**L5**	**CO-V**	**[7M]**

OR

10	***A***	If you were troubleshooting a network issue, how could TELNET assist you in diagnosing the problem?	**L3**	**CO-V**	**[7M]**
	B	Explain in detail about DNS	**L4**	**CO-V**	**[7M]**

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Code No: R20A0351

R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2024

Intellectual Property Rights

(CSE, IT, CSE-AIML, CSE-DS, CSE-IOT, B.Tech-AIDS & B.Tech-AIML)

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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			BCLL	CO(s)	Marks
		SECTION-I			
1	***A***	Explain the different types of intellectual property in detail?	**L1**	**CO-I**	**[7M]**
	B	Describe the importance of intellectual property rights?	**L2**	**CO-I**	**[7M]**
		OR			
2	***A***	Explain why agency is responsible for IPR registration with example?	**L4**	**CO-I**	**[7M]**
	B	Explain the role of WIPO in IPR?	**L1**	**CO-I**	**[7M]**
		SECTION-II			
3	***A***	Explain the acquisition of trademark right?	**L1**	**CO-II**	**[7M]**
	B	Discuss the functions of trademark?	**L2**	**CO-II**	**[7M]**
		OR			
4	***A***	What safeguards are required to protect the interest of Trade Secrets? Explain.	**L4**	**CO-II**	**[7M]**
	B	Explain the liability of misappropriation of trade secret?	**L1**	**CO-II**	**[7M]**
		SECTION-III			
5	***A***	Define the originality of material and how is defined?	**L2**	**CO-III**	**[7M]**
	B	Explain the copyright notice and when it is issued?	**L1**	**CO-III**	**[7M]**
		OR			
6	***A***	Explain the procedure for filling the copyright registration?	**L1**	**CO-III**	**[7M]**
	B	What is the procedure for the registration of any electronic product with suitable example.	**L1**	**CO-III**	**[7M]**
		SECTION-IV			
7	***A***	Explain the joint collaboration agreement in relation to IP rights.	**L1**	**CO-IV**	**[7M]**
	B	Write the process of protecting Intellectual property?	**L1**	**CO-IV**	**[7M]**
		OR			
8	***A***	Explain the factors that need to be considered for a successful technology licensing,	**L2**	**CO-IV**	**[7M]**
	B	Explain the salient features of deed of Assignment.	**L1**	**CO-IV**	**[7M]**
		SECTION-V			
9	***A***	What are cyber crimes? Give examples.	**L1**	**CO-V**	**[7M]**
	B	Define confidentiality agreement and Explain the need of privacy and data security.	**L1**	**CO-V**	**[7M]**
		OR			
10	***A***	Define international aspects of Computer and Online Crime?	**L2**	**CO-V**	**[7M]**
	B	What are the types of cybercrimes committed in e-commerce and what are the measures to be taken to prevent the cybercrimes in e-commerce.	**L2**	**CO-V**	**[7M]**

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Code No: R20A0026 **R20**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Supplementary Examinations, June 2024
Discrete Mathematics
(CSE, IT, CSE-CS, CSE-AIML, CSE-DS, B.Tech-AIDS & B.Tech-AIML)

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.

			BCLL	CO(s)	Marks
		SECTION-I			
1	*A*	Construct truth table for the following $\{(P \wedge Q) \vee (\Gamma P \wedge R)\} V (Q \wedge R)$	L3	CO-I	[7M]
	B	Show that $\Gamma(PV(\Gamma P \wedge Q))$ and $\Gamma P \wedge \Gamma Q$ are logically equivalent.	L3	CO-I	[7M]
		OR			
2	*A*	Show that the following implication $(P \longrightarrow Q) \longrightarrow Q \Longrightarrow P \vee Q$.	L3	CO-I	[7M]
	B	Obtain the Principal conjunctive normal form $(\Gamma P \rightarrow R) \wedge (Q \leftrightarrow P)$	L3	CO-I	[7M]
		SECTION-II			
3	*A*	Give an example of a relation which is irreflexive, anti-symmetric and transitive and justify.	L3	CO-II	[7M]
	B	Define Bounded lattice, Distributive lattice, Complement lattice	L3	CO-II	[7M]
		OR			
4	*A*	Let R be the relation on set A ={1, 2, 3, 4 } defined by R = {(1, 1), (1, 2), (2, 1),(2,2),(3,4), (4,3) (3,3) (4,4). Show that R is an equivalence relation and draw its diagraph.	L3	CO-II	[7M]
	B	Draw the Hasse diagram of (P (A), $\subseteq$) where A = $\{a, b, c\}$.	L3	CO-II	[7M]
		SECTION-III			
5	*A*	Show that the set G = {1,-1, i, -i} is a group with respect to multiplication.	L3	CO-III	[7M]
	B	Find the number of integers between 1 and 100 that are divisible by 2, 3, 5.	L3	CO-III	[7M]
		OR			
6	*A*	Define Homomorphism and isomorphism between two groups.	L3	CO-III	[7M]
	B	In how many ways can the letters {4a, 3b, 2c} be arranged so that all the letters of same kind are not in a single block.	L3	CO-III	[7M]
		SECTION-IV			
7	*A*	Find the coefficient of x^{25} in$(1 + x^3 + x^8)^{10}$.	L3	CO-IV	[7M]
	B	Solve the recurrence relation $a_n = 4(a_{n-1} - a_{n-2})$, $a_0 = 1$ $a_1 = 3$.	L3	CO-IV	[7M]
		OR			

8		Solve the recurrence relation $a_{n+2} - 5a_{n+1} + 6a_n = 2$ with initial condition $a_0 = 1\ and\ \ a_1$ = -1.	L3	CO-IV	[14M]
		SECTION-V			
9	*A*	What are the steps involved in determining whether two given graphs are isomorphic are not?	L3	CO-V	[7M]
	B	Define tree, Binary tree, Spanning tree, minimal spanning tree.	L3	CO-V	[7M]
		OR			
10	*A*	State the Euler's Theorem of graph theory. What is the largest possible number of vertices in a graph with 35 edges and all vertices of degree at least three?	L3	CO-V	[7M]
	B	Define Euler's Circuit ,Hamilton path, Hamilton cycle.	L3	CO-V	[7M]

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