

Code No: R20A0026

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, July 2023**Discrete Mathematics****(CSE, IT, CSE-CS, CSE-AIML, CSE-DS, AIDS & 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.

SECTION-I**Marks**

- 1 A Construct the truth table for the following formula [7M]
 $(\sim P \wedge (\sim Q \wedge R)) \vee (Q \wedge R) \vee (P \wedge R)$.
- B Show that following Proposition function is tautology using truth table [7M]
 $((P \rightarrow Q) \wedge (Q \rightarrow R)) \rightarrow (P \rightarrow R)$.
 OR
- 2 A Show that following functions are logical equivalence using laws of logic method [7M]
 $\sim(P \leftrightarrow Q) \Leftrightarrow (P \vee Q) \wedge \sim(P \wedge Q)$
- B Obtain the Principle Disjunctive normal forms of the following [7M]
 i) $P \vee (P \wedge Q)$ ii) $P \rightarrow \{ (P \rightarrow Q) \wedge \sim(\sim Q \vee \sim P) \}$

SECTION-II

- 3 A Define (i) Sub lattice (ii) Complete lattice (iii) Distributive lattice. [6M]
 B Given $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ and a relation R on S where $R = \{(x, y) / x + y = 10\}$. [8M]
 What are the properties of the relation R?
 OR
- 4 A Let $P = \{1, 2, 3, 4, 6, 12\}$ and \leq be the relation on P such that $x \leq y$ if and only if x divides y. Draw the Hasse diagram for the poset (P, \leq) . [7M]
 B Explain different types of functions. Find the inverse of function $f(x) = 3x + 7$. [7M]

SECTION-III

- 5 A Let N is set of positive integers. Check whether $(N, /)$ (The binary operation is division) is a monoid or not. [8M]
 B How many 5 letter words are there where first and last letters [6M]
 i) Are constants.
 ii) Are vowels.
 iii) Are vowels and the middle letters are constants.

OR

- 6 A Explain the principles of Inclusion– Exclusion with examples. [7M]
 B What is an algebraic structure? List and Explain different algebraic structures. [7M]

SECTION-IV

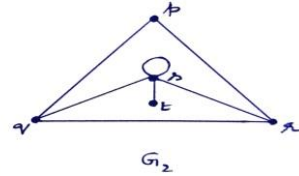
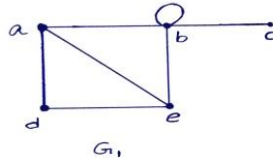
- 7 A Solve the Recurrence relation $a_n = 3a_{n-1} - 2a_{n-2}$ for $n \geq 2$, and $a_1 = 5, a_2 = 3$. [7M]
 B Find the recurrence relation and the initial condition for the sequence 2, 10, 50, 250, ... [7M]

OR

- 8 A Solve the recurrence relation $a_n = 7a_{n-1} - 10a_{n-2}$ with $a_0 = 2$ and $a_1 = 3$ for $n \geq 2$. [7M]
B Use the method of generating function to solve the recurrence relation $a_n = 4a_{n-1} + 3n \cdot 2^n$; $n \geq 1$ given that $a_0 = 4$. [7M]

SECTION-V

- 9 A Explain DFS algorithm to finding a spanning tree with an example. [7M]
B Examine whether the following Graphs G_1 and G_2 are isomorphic or not [7M]



OR

- 10 A Define terms binary tree, spanning tree and planar graphs. Explain with an examples. [7M]
B Explain Hamiltonian path and Hamiltonian cycle with an example. [7M]

Code No: R20A0507

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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II B.Tech II Semester Regular/Supplementary Examinations, July 2023**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.

SECTION-I**Marks**

- 1 **A** Design a DFA which accepts a strings aying 111 as substring over the input alphabet {0,1} **[7M]**
- B** Design a DFA that accepts even no.of a's and even no.of b's over the input alphabet {a,b} **[7M]**

OR

- 2 **A** Construct a NFA that accepts strings with two consecutive 0's are two consecutive 1's over the input alphabet {0,1} **[7M]**
- B** Convert the NFA obtained in 2.A to equivalent DFA **[7M]**

SECTION-II

- 3 **A** List the identity rules of regular expressions **[7M]**
- B** Is $L = \{a^i b^j / i > 0\}$ is regular? Explain **[7M]**

OR

- 4 **A** Define a derivation tree. Give LMD and RMD using productions $S \rightarrow AA/A, A \rightarrow AA/aA/Ab/a/b$ for string baaba **[7M]**
- B** Construct a CFG which accepts the strings of the form (aa^+/bb^+) **[7M]**

SECTION-III

- 5 **A** Construct a regular grammar which can generate the set of all strings starting with a letter(a to z) followed by a string of letters or digits(0 to 9) **[7M]**
- B** Differentiate between right linear and left linear grammar **[7M]**

OR

- 6 **A** Give a CFG which accepts equal no.of a's and b's over input alphabet {a,b} **[7M]**
- B** Give a CFG for R.E. $(011+1)^*(01)^*$ **[7M]**

SECTION-IV

- 7 **A** How do you eliminate unit productions and ϵ productions in CFG explain with examples **[7M]**
- B** Convert the following grammar into CNF
 $S \rightarrow AaA, A \rightarrow aaBa/CDA/CD, B \rightarrow bB, C \rightarrow Ca/D, D \rightarrow bD/\epsilon$ **[7M]**

OR

- 8 **A** Define ambiguous grammar. Can we convert ambiguous grammar into unambiguous grammar ? justify your answer with proper examples. **[7M]**
- B** Compare and contrast between DPDA and NPDA **[7M]**

SECTION-V

- 9 **A** Discuss about recursive languages closure properties **[7M]**
- B** Explain Chomsky hierarchy of languages **[7M]**

OR

- 10 **A** Explain PCP with suitable example **[7M]**
- B** Discuss about NP-Complete and NP-Hard problems give examples **[7M]**

R20Code No: **R20A0509****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**
(Autonomous Institution – UGC, Govt. of India)**II B.Tech II Semester Regular/Supplementary Examinations, July 2023****Database Management Systems**

(CSE, IT, CSE-CS, CSE-AIML, CSE-DS, CSE-IOT & 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.

SECTION-I

- 1 A List out the applications of Database System. Explain the Purpose of Database Systems. [7M]
B Illustrate Entities, Attributes, Entity sets, Relationships and Relationship sets in detail with suitable examples. [7M]

OR

- 2 A List and explain various types of Database Users. [7M]
B Discuss Relational Query Languages and Relational Operations in detail. [7M]

SECTION-II

- 3 A Illustrate Set Operations with an example.
i. Union [2M]
ii. Intersection [2M]
iii. Difference [2M]

- B Illustrate Aggregate Functions in detail with an example. [8M]

OR

- 4 A Explain the following with an example.
i. Selection [2M]
ii. Projection [2M]
iii. Renaming [2M]
iv. Division [2M]
B Explain the following with an example.
i. GROUPBY [2M]
ii. HAVING [2M]
iii. Views [2M]

SECTION-III

- 5 A Define functional dependency with an example. Explain 2NF and 3NF with examples. [7M]
B Define Join dependencies. and Illustrate Fifth normal form in detail with examples. [7M]

OR

- 6 A Illustrate BCNF and 3NF in detail with examples. [8M]
B Explain Lossy decomposition and lossless decomposition with an example. [6M]

SECTION-IV

- 7 A Explain Lock Based Protocols in detail. [7M]
 B What is Transaction? Explain the ACID properties of transactions. [7M]

OR

- 8 A Define Serializability. Discuss various types of Serializability. [7M]
 B Explain the need of concurrency control. [7M]

SECTION-V

- 9 A Explain the checkpoint log-based recovery scheme for recovering the database. [7M]
 B Illustrate log-based recovery scheme in detail. [7M]

OR

- 10 A Explain Failure with loss of non-volatile storage. [7M]
 B Discuss briefly Buffer Management. [7M]

Code No: **R20A0508**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Regular/Supplementary Examinations, July 2023
Object Oriented Programming through Java
(CSE, IT, CSE-CS, CSE-AIML, CSE-DS & CSE-IOT, AIDS & AIML)

Roll No									
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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.

SECTION-I

- | | | | |
|----------|----------|--|-------------|
| 1 | A | What are overloaded constructors? Write a program to demonstrate them. | [7M] |
| | B | Define a string. List and explain any string handling methods with examples. | [7M] |

OR

- | | | | |
|----------|----------|--|-------------|
| 2 | A | Discuss in detail about Object Oriented Concepts. | [7M] |
| | B | Explain different types of constructors with an example. | [7M] |

SECTION-II

- | | | | |
|----------|----------|---|--------------|
| 3 | A | Explain the concept of inheritance and give examples on each type of inheritance. | [10M] |
| | B | What is the difference between Interface and abstract classes? | [4M] |

OR

- | | | | |
|----------|----------|--|-------------|
| 4 | A | What is an Inheritance? Explain single level and multiple inheritances in java.Explain briefly with an example program | [7M] |
| | B | Explain creation of a package and importing a package | [7M] |

SECTION-III

- | | | | |
|----------|----------|--|-------------|
| 5 | A | Differentiate between thread and process. Describe the life cycle of a thread in Java. | [7M] |
| | B | What is an Exception? Write about all exception handling keywords used in java. | [7M] |

OR

- | | | | |
|----------|----------|---|-------------|
| 6 | A | Why do we need Thread Synchronization? Give an example program. | [7M] |
| | B | Briefly discuss about the concept of multiple catch statements. | [7M] |

SECTION-IV

- | | | | |
|----------|----------|--|-------------|
| 7 | A | What is a File? Explain File creation with an example. | [7M] |
| | B | Write a program to copy one file content in to another file. | [7M] |

OR

- | | | | |
|----------|----------|--|-------------|
| 8 | A | What is an ArrayList in Java? Explain with an example. | [7M] |
| | B | Explain different types of drivers used in JDBC. | [7M] |

SECTION-V

- | | | | |
|----------|----------|---|-------------------------------|
| 9 | A | Explain the AWT hierarchy classes with suitable diagram. | [8M] |
| | B | Write short notes on: i) Flow Layout
ii) Border Layout
iii) Grid Layout | [2M]
[2M]
[2M] |

OR

- | | | | |
|-----------|----------|---|-------------|
| 10 | A | Write a program to demonstrate Keyboard Event Handling. | [7M] |
| | B | Explain about Swing components with examples. | [7M] |

Code No: R20A0351

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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II B.Tech II Semester Regular/Supplementary Examinations, July 2023**Intellectual Property Rights**

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

Roll No									
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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.

SECTION-I**Marks**

- 1 **A** Discuss the importance of intellectual property rights. [7M]
 B Explain why the International Organization, Agencies and Treaties were established? [7M]

OR

- 2 **A** Assess the role and value of IP in international commerce [7M]
 B Illustrate the intellectual property rights with suitable examples [7M]

SECTION-II

- 3 **A** Explain trademarks and types of trademarks in detail. [7M]
 B Examine the selection and evaluation of trademark [7M]

OR

- 4 **A** Discuss about the Geographical Indications of Goods [7M]
 B Categorise the liability for misappropriation of trade secrets [7M]

SECTION-III

- 5 **A** Explain in detail about process involved in searching a patent. [7M]
 B Demonstrate the Fundamentals of copyright law [7M]

OR

- 6 **A** Identify the right of reproduction in copy rights [7M]
 B Determine the basic Criteria of Patentability [7M]

SECTION-IV

- 7 **A** Write a note on cease and desist letter. [7M]
 B Write a short note on joint collaboration agreement and deed of assignment [7M]

OR

- 8 **A** What is settlement memorandum give suitable examples [7M]
 B Write a short notes on assignment contract and license agreement. [7M]

SECTION-V

- 9 **A** What are the new developments in Information Technology Act [7M]
 B Discuss cyber crime and e-commerce [7M]

OR

- 10 **A** Appraise International aspects of online crime. [7M]
 B Discuss the role of confidentiality in Cyber law [7M]

Code No: R20A0510

R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, July 2023

Computer Networks

(CSE & IT)

Roll No									
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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.

SECTION-I

Marks

- 1 A Write the advantages of Computer Networks. [7M]
- B Summarize the differences between OSI and TCP/IP model. [7M]

OR

- 2 A Explain about TCP/IP reference model. [7M]
- B State the major functions performed by the presentation layer of the ISO OSI reference model. [7M]

SECTION-II

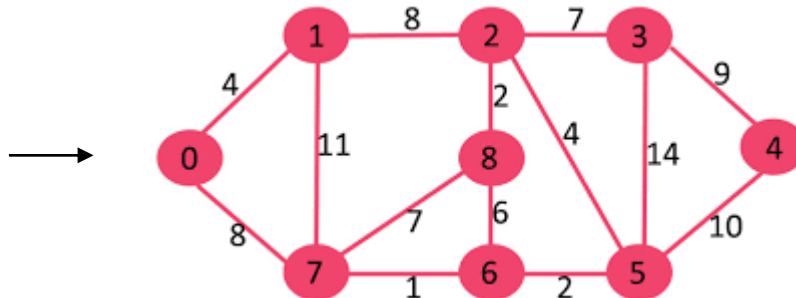
- 3 A Discuss the Flow Control and error Control Mechanism in DLL (Data Link Layer). [7M]
- B In a CSMA / CD network running at 1Gbps over 1KM cable with no repeaters, the signal speed in the cable is 200000 km/sec. What is the minimum frame size? [7M]

OR

- 4 A Discuss the uses of two-dimensional parity in error detection. [7M]
- B A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x^4+x+1 . What is the actual bit string transmitted? [7M]

SECTION-III

- 5 A Identify the shortest path for the given network [7M]



- B Discuss about design issues in Network Layer. [7M]
- OR
- 6 A Describe various special IP addresses with details. [7M]
 - B Discuss about IPV4 and IPV6. [7M]

SECTION-IV

- 7 **A** List and explain about elements of Transport Protocol. [7M]
 B Describe the header format of UDP with a suitable diagram. [7M]

OR

- 8 **A** With neat sketch explain working of sliding window Protocol. [7M]
 B Explain about the TCP header and the working of TCP protocol. [7M]

SECTION-V

- 9 **A** Explain the roles and responsibilities of the Application Layer. [7M]
 B Show the differences between a user agent (UA) and a mail transfer agent (MTA). [7M]

OR

- 10 **A** Give the format of the HTTP response message. And explain with a suitable scenario. [7M]
 B Discuss in detail about three types of WWW documents. [7M]
