MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II B.TECH I SEMESTER R22 REGULAR QUESTION BANK

(UNITWISE ,MODEL AND PREVIOUS QUESTION PAPERS)

2023-24

LIST OF SUBJECTS

CODE	NAME OF THE SUBJECT
R22A0506	DESIGN AND ANALYSIS OF ALGORITHMS
R22A0505	SOFTWARE ENGINEERING
R22A0503	DATA STRUCTURES
R22A0504	DATABASE MANAGEMENT SYSTEMS

II B.TECH I SEMESTER R22 REGULAR QUESTION BANK

(UNITWISE ,MODEL AND PREVIOUS QUESTION PAPERS)

2023-24

R22A0506: DESIGN AND ANALYSIS OF ALGORITHMS

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Certified) Maisammaguda, Dhulapally (Post Via Hakimpet), Secunderabad – 500100, Telangana State, India.
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R22A0506: DESIGN AND ANALYSIS OF ALGORITHMS

UNITWISE QUESTIONS

S.No		UNIT-1
1		Define performance analysis, time and space complexity. Explain with
2		example
		a) Explain the process of designing an algorithm. Give characteristics of an
		algorithm.
3		b) Explain asymptotic notations.
		For $T(n) = 7T(n/2) + 18n2$. Solve the recurrence relation and find the time
4		complexity.
		a) Give the general procedure of divide and conquer Method.
		b) Write the algorithm for binary search and discuss its complexity.
5		Illustrate Merge Sort algorithm and discuss its time complexity
6		Illustrate Quick Sort algorithm and discuss its time complexity
7		Explain Strassen's Matrix Multiplication and its time complexity.
8		Simulate quick sort algorithm for the following example
		25,36,12,4,5,16,58,54,24,16,9,65,78
9		What is pseudo-code? Explain with an example?
		UNIT-2
1.		Explain AND/OR Graphs.

2.		a) Explain about Disjoint set operations.
.		b) Write short notes on spanning tress.
3		What is an articulation point? How to find articulation point for a given graph
4		Discuss union and find algorithm in details with an example
5		a) Explain Prim's algorithm for minimal spanning tree with an example
		b) Write about Hamiltonian Cycle with example
6		Explain about bi-connected components in details.
7		a) Compare between connected and bi-connected components
		b) Differentiate Prim's vs Kruskal algorithm
8		How do you construct a minimum spanning tree using Kruskal algorithm explain? List any two applications
9		Explain General method of Greedy method. Find the greedy solution for following job sequencing with deadlines problem n= 7, (p1,p2,p3,p4,p5,p6,p7) = (3,5,20,18,1,6,30), (d1,d2,d3,d4,d5,d6,d7)=(1,3,4,3,2,1,2)
10		a) A motorist wishing to ride from city A to B. Formulate greedy based algorithm to generate shortest path and explain with an example
		b)What is the solution generated by function job sequencing algorithm, when n=6, (p1,…p6) = (3,5,20,18,1,6) and (d1,d2,…d6) = (1,3,4,3,2,1).
11		Write a greedy algorithm for sequencing unit time jobs with deadlines and profits.
12		Derive time complexity for job sequencing with deadlines. Obtain the optimal solution when n=5, (p1,p2 ….) =(20,15,10,5,1) and (d1,d2,…) = (2,2,1,3,3)
13		Define Greedy knapsack. Find the optimal solution of the knapsack instance n=7, M=15, (p1,p2,…p7) = (10,5,15,7,6,18,3) and (w1,w2,….w7) = (2,3,5,7,1,4,1).
14		Define Greedy Knapsack. Find an optimal solution of the knapsack instance n = 7, M=20, (p1,p2,….p7) = (8,5,6,7,12,3) and (w1,w2,…..w7) = (2,10,8,7,6,4,11)
15		Give the optimal solution for 0/1 knapsack problem using greedy method.

		(p1,p2,p3,p4) = (11,21,31,33), (w1,w2,w3,w4) = (2,11,22,15), M=40, n=4.

		UNIT-3
1.		Write about 0/1 knapsack problem with an example.
2.		Explain how solution will be provided for all pairs shortest path problem using dynamic programming.
3.		Explain optimal binary search tree with an example
4.		a) Differentiate Greedy and dynamic programming
5.		Explain Matrix Chain Multiplication in dynamic programming.
6		Solve the travelling salesman problem using dynamic programming.
7		Write a function to compute lengths of shortest paths between all pairs of nodes for the given adjacency matrix $$\begin{vmatrix} 0 & 6 & 13 \\ 8 & 0 & 4 \\ 5 & \infty & 0 \end{vmatrix}$$
8		state dynamic programming. Explain with one example
9		Write algorithm of all pairs shortest path
10		Find the optimal travelling for the following $$\begin{vmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{vmatrix}$$
		UNIT-4
1.		Explain the chained matrix multiplication with suitable example.
2		a) Define Graph coloring and write algorithm to find Hamiltonian Cycles. b) Explain general method of back tracking
3		How n-Queen's problem can be solved using backtracking and explain with example.
4		Write algorithm of sum of subsets problem
5		consider s={5,10,12,13,15,18) , N=30. Solve it by sum of subsets strategy
6		Generate all possible 3 coloring for the following graph with 4 nodes using a state space tree
7		Draw a state space tree of sum of subsets where n=3,m=3.

8		Write the algorithm of Hamiltonian Cycle
		UNIT-5
1.		What is state space tree? What are the different ways of searching an answer node in an state space tree. Explain with example.
2.		a) Difference between NP-Hard and NP-Complete problems
		b) Explain FIFO branch and bound Solution
3		a) Explain the general method of branch and bound technique
		b) Explain 0/1 knapsack problem in Branch and Bound technique.
4.		a) Write and explain the cook's theorem and write its time complexity
		b) What is non deterministic algorithm. Explain
5		Discuss and draw the portion of state space tree generated by FIFOBB for the following instance of 0/1 knapsack n=5, M=12, (p1,…p5) = (10,15,6,8,4) and (w1,…..w5) = (4,6,3,4,2)
6		Draw the portion of state space tree generated by LCBB for the knapsack instance n=5, (p1,p2,p3,p4,p5) = (10,15,6,8,4) and (w1,w2,w3,w4,w5) = (4,6,3,4,2) & m=12.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.TechII Semester Supplementary Examinations, October/November 2020
Design and Analysis of Algorithms
(CSE& IT)

Roll No										

Time: 2 hours   **Max. Marks: 75**

Answer Any **Four** Questions
All Questions carries equal marks.

1   Explain about the Performance Analysis-Space complexity

2   Write short notes on a)Big oh notation b)Omega notation c)Theta notation

      d) Little oh notation,

3   Discuss about the union and find algorithms

4   Illustrate the Spanning tree with example

5   Describe the Minimum cost spanning trees

6   Explain about the Single source shortest path problem

7   Discuss about the Hamiltonian cycles

8   Explain about the Basic concepts of NP-Complete Problem

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R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Supplementary Examinations, Oct/Nov 2020
Design and Analysis of Algorithms
(CSE &IT)

Roll No										

Time: 2 hours   **Max. Marks: 70**

Answer Any **Four** Questions
All Questions carries equal marks.
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1 a) Explain the role of instance characteristics in finding the time and space complexities with an example.

   b) Explain the Strassen's matrix multiplication algorithm with an example?

2 a) Give the algorithm for transpose of a matrix m x n and determine the time complexity of the algorithm by frequency – count method.

   b) What is the time complexity of following function fun ()? Explain

```
int fun(int n) {
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j < n; j ++) {
            Sum = Sum +i*j; } }
    return(Sum); }
```

3 a) Write Divide – and – Conquer recursive Merge sort algorithm and derive the time complexity of this algorithm.

   b) What is a Minimum Cost Spanning tree? Explain Kruskal's Minimum cost spanning tree algorithm with suitable example.

4 a) State the Job – Sequencing with deadlines problem. Find an optimal sequence to the n=5 Jobs where profits (P1, P2, P3, P4, P5) = (20, 15, 10, 5, 1)and deadlines (d1, d2, d3, d4, d5) = (2, 2, 1, 3, 3).

   b) Explain the basic methodology of Divide – and – Conquer technique. List the advantages of divide and conquer algorithm.

5 a) Describe the Dynamic 0/1 Knapsack Problem. Find an optimal solution for the dynamic programming 0/1 knapsack instance for n = 3, m = 6, profits are (p1, p2, p3) = (1, 2, 5), weights are (w1, w2, w3)=(2, 3, 4).

   b) Compare between the divide and conquer technique and the dynamic programming technique?

6 a) Describe the Matrix multiplication chains problem. Apply the recursive solution of dynamic programming to determine optimal sequence of pair wise matrix multiplications

   b) Explain the Optimal Binary Search Tree with an example.

7 a) Compare BFS and DFS algorithm with an example graph and denote its time complexities

   b) What is a Hamiltonian Cycle? Describe the algorithm for Hamiltonian cycles and determine the order of magnitude of the worst-case computing time for the backtracking procedure that finds all Hamiltonian cycles.

8 a) Explain the strategy to prove that a problem is NP hard.

   b) Explain the non-deterministic sorting problem.

   c) Explain the classes of NP-Hard and NP-Complete.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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II B.Tech II Semester Regular Examinations, October/November 2020
Design and Analysis of Algorithms
(CSE)

Roll No										

Time: 2 hours   **Max. Marks: 70**

Answer Any **Four** Questions
All Questions carries equal marks.
***

1   (a) Sort the list 315, 113, 600, 415, 612, 615 using Merge sort algorithm. Also explain the time complexity of merge sort algorithm. (10 M)
(b)Compare Merge sort and Quick sort (4 M)

2   Explain Strassen's algorithm for matrix multiplication with the help of an example.

3   Describe the algorithm for Hamiltonian cycles and Determine the order of magnitude of the worst-case computing time for the backtracking procedure that finds all Hamiltonian cycles.

4   Discuss about 8-queen problem.

5   Define spanning tree. Write Kruskal's algorithm for finding minimum cost spanning tree. Describe how Kruskal's algorithm is different from Prim's algorithm for finding minimum cost spanning tree.

6   A motorist wishing to ride from city A to B. Formulate greedy based algorithms togenerate shortest path and explain with an example graph.

7   Obtain reduced cost matrix for travelling sales person problem. Consider theinstance define by the cost matrix:
[∞ 5 110 6]
[1∞ 4 12 7]
[36 ∞ 4 16]
[7 1 3 ∞ 9]
[16 12 7 6 ∞]

8   What is class NP? Discuss any five problems for which no polynomial time algorithm has been found

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II B.TECH I SEMESTER R22 REGULAR

QUESTION BANK

(UNITWISE, MODEL AND PREVIOUS QUESTION PAPERS)

2023-24

R22A0505: SOFTWARE ENGINEERING

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(Autonomous Institution — UGC, Govt. of India)
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R22A0505: SOFTWARE ENGINEERING

UNITWISE QUESTIONS

S.No		UNIT-1
1		Explain the evolving role of software and explain changing nature of software indetail
2		Explain "Software myth"? Discuss on various types of softwaremyths and the true aspects of these myths
3		What is Software Maturity Model and Explain in detail about the Capability Maturity Model Integration (CMMI) Process
4		Describe SDLC? Compare any two Software Development Models in detail
5		Explain process frame work activities
		UNIT-2
1		Explain requirement engineering process
2		Compare functional requirements with non-functional requirements
3		Discuss how feasibility studies are important in requirement engineering process.
4		Explain context models, Behavioural models, Data models and Object Model inbriefly
5		Discuss briefly how requirement validation is done?
		UNIT-3
1		Discuss briefly the following fundamental concepts of software design: i) Abstraction ii) Modularity iii) Information hiding.
2		Explain software architecture in a detail manner
3		What are the goals of the user interface design
4		Discuss architectural styles and patterns
5		Describe mapping data flow into a software architecture
6		What are the design concepts in software engineering
		UNIT-4
1		Explain about the importance of test strategies for conventional software

2		Compare black box testing with white box testing and Compare Alpha Testing with Beta Testing
3		Discuss an overview of quality metrics
4		Explain about Metrics for maintenance
5		Explain in detail about Software Measurement?
6		Elaborate the concepts of Risk management Reactive vs Proactive Risk Strategies, How the risk will be identified and Explain the RMMM Plan in brief

		UNIT-5
1		Explain about Quality concepts?
2		Explain software quality assurance
3		Explain in detail ISO 9000 quality standards
4		Explain about Software Reviews and formal technical reviews
5		Discuss software reliability

II B.TECH I SEMESTER R22 REGULAR

QUESTION BANK

(UNITWISE, MODEL AND PREVIOUS QUESTION PAPERS)

2023-24

R22A0503: DATA STRUCTURES

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
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R22A0503: DATA STRUCTURES

UNITWISE QUESTIONS

S.No		UNIT-1
1		a) What is inheritance?List different types of Inheritances and explain any 2 in detail.
		b) Define Polymorphism in Python with an example.
2		a) Discuss briefly about OOP concepts?
		b) What is a constructor? Explain various types in detail?
3		a) Define inheritance. What are the benefits of inheritance?
		b) How to prevent a class from inheritance. Demonstrate with an example>
4		a) Explain single ,multiple inheritance?
		b) Does Python support Method Overloading? Justify your answer with one example?
5		a) Explain Method Overriding?
		b) Explain about abstract classes in Python?
6		a) ExplainTypes of methods in Python?
		b) Explain about any 2 Access specifiers in python?
7		Write a Python program for class, Flower, that has three instance variables of type str, int, and float, that respectively represent the name of the flower, its number of petals, and its price.Your class must include a constructor method that initializes each variable to an appropriate value, and your class should include methods for setting the value of each type, and retrieving the value of each type.
		UNIT-2
1		Compare and Contrast Linear & Non-Linear Data Structures?
		b) Write a python program to find the smallest and largest number in the list.

2		a)What is a Dictionary in Python? Explain various methods available with dictionary
		b)What is a set? Explain any 4 set methods
3		a) Explain any 6 string functions in python?
		b) Explain in Detail about String Slicing in python
4		a) What is an array? Explain various types of arrays with an example
		b) Write a program to read values from keyboard to perform matrix addition
5		a) Define Tuple? Explain with an example python syntax and code ?
		b) Define Lists ? Explain any 3 methods of lists with an example?
6		a) Explain the below methods of lists with examples? 1)insert() 2)remove() 3)append() 4)len()
		b) Define String? Explain any 4 methods of strings?
7		Differentiate between lists and tuples ?
		UNIT-3
1		Explain about linear search with an example.
		b. Write the code using python for linear search.
2		a. Demonstrate the technique of binary search with an example.
		b. Write the code for binary search using python.
3		a. What is bubble sort? Explain it with an example.
		b. Write code using python for bubble sort.
4		a. Discuss about selection sort with an example.
		b. Write code for selection sort using python.
5		a. Illustrate about insertion sort with an example
		b.Write the code using python for insertion sort.

6		a. Interpret about merge sort with an example
		b.Write the code using python for merge sort.
7		. Define Sorting. Explain step by step procedure for Quick Sort for the following elements 5 3 8 6 4 2
		b. Write the code for quick sort using python.
8		What is an array? Explain various types with an example
		UNIT-4
1		a) Define Stack. Explain various operations on Stack
		b) Explain Various applications of Stack with an example
2		a) Define Queue. Explain various operations on Queue
		b) Explain Various applications of Queue
3		Define Linked List. Explain different types of Linked Lists with an Example
4		Write a Python program to perform various operations on Single Linked List
5		What is a linked list?What a are various types of linked lists available.Write a Program on Inserting a node at the beginning of the Single Linked List
6		Define a double linked list? List and explain the different operations performed on doubly Linked List?
7		Write a python code to delete a node at the end of the double linked list?
8		Write a python code to implement a stack using Linked list ?

		UNIT-5
1		What is Graph Traversal and List out different graph traversal techniques?
		b) Explain DFS technique with an example?
2		What is a Binary Search Tree? Explain Various Tree Traversal techniques with an example.
3		What is an AVL Tree? Explain Different Rotations in AVL Tree. Illustrate with an Example.
4		Define Directed and Undirected graph b) Weighted and Unweighted graph c) Binary Tree
5		What is a binary Search Tree?Explain various operations on it.
6		What is an AVL Tree.Explain in detail with an example?
8		Explain about BFS Technique with an example?
5		Explain how to delete a node with children in a binary search tree with appropriate diagrams and procedure?

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Supplementary Examinations, April 2023
Data Structures
(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 Circular linked list and explain traversing, searching, insertion and deletion with sample code.	**[14M]**

OR

2		Explain singly linked list with an example.	**[14M]**

SECTION-II

3	*A*	What is Queue ADT and discuss its array implementation.	**[7M]**
	B	Explain Simple Queue and discuss its Linked list implementation.	**[7M]**

OR

4	*A*	Write a short note on Priority Queue and heaps.	**[4M]**
	B	Define Queue ADT and discuss its Linked list implementation.	**[10M]**

SECTION-III

5	*A*	Explain binary search methods with sample code.	**[7M]**
	B	Explain selection Sort and explain it with code.	**[7M]**

OR

6	*A*	Explain graph traversal techniques with an example.	**[7M]**
	B	Define merge Sort and explain it with code.	**[7M]**

SECTION-IV

7		Discuss in detail about Dictionaries.	**[14M]**

OR

8		Explain hashing and its representations.	**[14M]**

SECTION-V

9	*A*	Define AVL Tree? Explain various notations of AVL Tree	**[7M]**
	B	Explain about B-Tree and its operations with an example.	**[7M]**

OR

10	*A*	Discuss binary search tree with an example.	**[7M]**
	B	Differentiate between AVL Tree and B+ Tree	**[7M]**

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Code No: R20A0503
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Regular Examinations, February 2022
Data Structures Using Python
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & 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.

***

SECTION-I

1 What is polymorphism? Explain different types of polymorphisms with clear programming examples **[14M]**

OR

2 Define inheritance. What are the benefits of inheritance? What costs are associated with inheritance? How to prevent a class from inheritance? **[14M]**

SECTION-II

3 Compare and Contrast Linear & Non-Linear Data Structures with illustrative examples **[14M]**

OR

4 What is Dictionary in Python? Classify various types of Comprehensions and its applications in programming **[14M]**

SECTION-III

5 Discuss in detail about Linear and Binary Search algorithms **[14M]**

OR

6 Analyze representation of arrays along with its advantages and disadvantages. Explain matrix multiplication using arrays with an example **[14M]**

SECTION-IV

7 Write an algorithm to insert new node at the beginning, at middle position and at the end of a Singly Linked List. **[14M]**

OR

8 List the applications of stacks and Queues to represent polynomial expressions **[14M]**

SECTION-V

9 Compare and Contrast Weighted Vs Unweighted Graphs? Write the algorithm for Depth First Search with clear example **[14M]**

OR

10 Discuss about Various Tree Traversal Techniques and its implementation details. **[14M]**

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R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Supplementary Examinations, April 2023
Data Structures using C++
(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.

***

SECTION-I

1	A	Design a program to implement Linear search?	[7M]
	B	Discuss briefly about merge sort with an Example?	[7M]

OR

2	A	Explain in detail about Heap sort with an example?	[7M]
	B	Write a Program to implement insertion sort?	[7M]

SECTION-II

3	A	Briefly explain various operations of stack with suitable examples.	[7M]
	B	Design a program to implement Queue using linked list?	[7M]

OR

4	A	Explain in detail about Binary search tree traversals with an example?	[7M]
	B	How can you implement the insertion operation using linked list? Explain.	[7M]

SECTION-III

5	A	Explain about Priority queue using heap insertion and deletion concepts?	[7M]
	B	Discuss briefly about Multiway **merge sort with an example?**	[7M]

OR

6	A	Explain in detail about External sorting with suitable example?	[7M]
	B	List and explain in detail about the Polyphase merge with suitable examples	[7M]

SECTION-IV

7	A	Discuss about the Linear representation of Dictionaries?	[7M]
	B	List and explain in detail about the various operations of skip list with suitable examples?	[7M]

OR

8	A	Define collision? Explain in detail collision resolution technique?	[7M]
	B	Explain hashing and skip list with an example.	[7M]

SECTION-V

9	A	Explain BFS and DFS with an example.	[7M]
	B	Write an algorithm to implement BFS?	[7M]

OR

10		Define AVL tree. Explain AVL tree rotations with an example.	[14M]

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DEPARTMENTOFCOMPUTER SCIENCE AND ENGINEERING

II B.TECH I SEMESTER R22 REGULAR QUESTION BANK

(UNITWISE ,MODEL AND PREVIOUS QUESTION PAPERS)

2023-24

II B.TECH I SEMESTER R22 REGULAR
QUESTION BANK

(UNITWISE ,MODEL AND PREVIOUS QUESTION PAPERS)

2023-24

R22A0504: DATABASE MANAGEMENT SYSTEMS

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
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R22A0504: DATABASE MANAGEMENT SYSTEMS

UNITWISE QUESTIONS

S.NO		
		UNIT-1: Database System & Data Models
1	A	Describe storage manager component of database system structure?
	B	Explain levels of abstraction in DBMS
2		What are the application programs? Explain database access from application programs?
3		Explain the E-R diagram components and notations with their extended features?
4		Define DBMS? List Database system applications
5		List four significant differences between a file processing system and a DBMS?
6		Explain about the Purpose of Database system &advantages of DBMS.
7		Discuss the basic concepts of E-R Model
8		What are the different data models? Explain E-R model and relation model briefly?
9		Define a) Entity b) Attribute c) Relationship with examples
10		State and explain various features of E-R Models
11	A	What are the Different types of Data Models? Explain with example.
	B	Briefly explain about views of data.
12	A	Discuss the correspondence between the ER model construct and the relational model constructs.
	B	Show how each ER model construct can be mapped to the relational model
	C	State and explain data base schema
13	A	Discuss the various applications of Databases in the day-to-day life.

	B	Explain the components of Database System Architecture
		UNIT-2: Relational Algebra & Overview of the SQL Query Language
1		What are the various operators used in Relational Algebra? Explain with an example for each.
		Illustrate the purpose of triggers in the databases with a suitable example
2		Explain the select, project, Cartesian product and join operation in relational algebra with an example
3		Describe the following in SQL with examples
	A	Nested Queries
	B	Correlated Queries
	C	Group by and Having Clauses
	D	Triggers
4		Discuss Tuple relational calculus with suitable examples?
5		Explain about data integrity constraints
6		Explain about various types of JOIN operations in SQL
7		Explain the following
	A	Lossless Join
	B	Lossless decomposition
8		Discuss about Domain Relational Calculus? Write and explain a query in DRC to Find the names of sailors who have reserved boat 103
9		What is a view? Explain about views in detail?
10		Explain the Division operator of Relational algebra with a suitable example. What is the usage of 'group by' and 'having' clauses in SQL?
11		Consider the following schema to write queries in Domain relational calculus: Sailor(sid, sname, age, rating) Boats(bid, bname, bcolor) Reserves(sid,bid,day)
	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
		UNIT-3: Normalization
1		Define functional dependency? How can you compute the minimal cover for a set of functional dependencies? Consider schema R = (A, B, C, G, H, I) and the set F of functional dependencies {A→B, A→C, CG →H, CG →I, B →H}. Compute the candidate keys of the schema. Compute the closure of the same.
2		What are the steps to be followed to convert a relation in 3NF to BCNF? Illustrate multi value dependencies and 4NF with examples?

3		What is Normalization? Explain different normal forms based on FDs?
		What is a functional dependency? Explain with an example? When is an FD implied by a set of F of FDs?
4		Explain first normal form, second normal form, third normal form and BCNF with an example
5	A	Discuss the join dependency and the fifth normal form-5NF
	B	Write about decomposition preservation algorithm for all FD's
6		Explain fourth normal form and BCNF with examples
7		What are the advantages of normalized relations over the unnormalized relations?
		UNIT-4: Transaction Concept
1		Explain about ACID properties
2		What is Serializability? Explain its Types
3		Explain about Concurrent execution of transactions?
4		What are the transaction isolation levels in SQL?
5		Explain how concurrency execution of transactions improves overall system performance?
6		Define the concept of schedule for a set of concurrent transaction. Give a suitable example?
7		Write the locking compatibility matrix used for multiple granularity? Explain with suitable examples?
8	A	How the use of 2PL would prevent interference between the two transactions
	B	Explain the difference between strict 2PL and rigorous 2PL?
9	A	How the time stamps are implemented? Explain
	B	With a neat Sketch explain the states of a transaction
10		Explain validation protocols?
		Unit-5: Recovery and Atomicity
1		Explain different recovery techniques used in transaction failure?
2		What is a checkpoint? Explain how checkpoints can be used in recovery of databases.
		Discuss about buffer management in Databases
3		Explain lock based concurrency control in detail?
4		Explain about Concurrent execution of transactions?
5		How the data will be recovered by concurrent transcations?
6		How the volatile and the nonvolatile storage device are differ from each other?
7		What is Log Based Recovery and recovery base Transactions?

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R22

(Autonomous Institution – UGC, Govt. of India)
DATABASE MANAGEMENT SYSTEMS
MODEL PAPER-I

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

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. What is logical data independence and why is it important?

OR

2. a) What is partial key? How is it represented in ER diagram? Give an example?
   b) What is a descriptive attribute? Explain?
   c) Discuss the usage of ISA feature in ER diagram?

SECTION – II

3. Explain the following with examples.
        a) Key constraints. b) Foreign key constraints.

OR

4. What is a view? Explain about views in detail?

SECTION – III

5. Explain the following
        a) Lossless Join   b) Lossless decomposition

OR

6. What are the advantages of normalized relations over the unnormalized relations?

SECTION – IV

7. a) How the use of 2PL would prevent interference between the two transactions.
   b) Explain the difference between strict 2PL and rigorous 2PL?

OR

8. Explain different recovery techniques used in transaction failure?

SECTION – V

9. How the volatile and the nonvolatile storage device are differ from each other?

OR

10. How the data will be recovered by concurrent transcations?

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R22

(Autonomous Institution – UGC, Govt. of India)
DATABASE MANAGEMENT SYSTEMS
MODEL PAPER-II

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

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1.   a) Describe storage manager component of database system structure?
        b) Explain levels of abstraction in DBMS

OR

2. Explain the E-R diagram components and notations with their extended features?

SECTION – II

3. Explain the following.
        a) Types of Join Operations   b) Set Operations

OR

4. a) Define Relational Algebra, tuple and domain relational calculus?
     b) What are the differences between the two types of relational calculus?

SECTION – III

5. Define BCNF? How does BCNF differ from 3NF? Explain with an example.
OR
6. What is Redundancy? What are the different problems encountered by redundancy? Explain them.

SECTION – IV

7. What are the transaction isolation levels in SQL?

OR

8. Explain how concurrency execution of transactions improves overall system performance?

SECTION – V
9. How the data will be recovered by concurrent transcations?

OR

10. What is Buffer Management? What is Log Based Recovery and recovery base Transactions?

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DATABASE MANAGEMENT SYSTEMS
MODEL PAPER-III

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

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. Define DBMS? List Database system applications.

OR

2. List four significant differences between a file processing system and a DBMS?

SECTION – II

3. a) Write a detail note on participation constraints?
   b) What is the class hierarchy? How is it represented in the ER diagrams?

OR

4. What are NULL values? Explain in detail.

SECTION – III

5. Explain FD and MVD with examples

OR

6. What is Normalization? Discuss what are the types? Discuss the 1NF, 2NF, 3NF with example?

SECTION – IV

7. What are the types of failures of a system?

OR

8. What are the two tables used in crash recovery along with log record? Explain with suitable example?

SECTION – V

9. What is Buffer Management??

OR

10. What is Log Based Recovery and recovery base Transactions?

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
DATABASE MANAGEMENT SYSTEMS
MODEL PAPER-IV

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

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. Explain key constraints with an example?

OR

2. Discuss the query processor of database system structure?

SECTION – II

3. Explain different types of Join Operations with relevant examples.

OR

4. Explain the following in SQL with examples.
  a) Nested Queries   b) Correlated Queries
  c) Group by and Having Clauses   d) Triggers

SECTION – III

5. Explain about the fourth and fifth normal forms.
OR
6. Define Functional dependencies? How are primary keys related to functional dependencies?

SECTION – IV

7. Write the locking compatibility matrix used for multiple granularity?
   Explain with suitable examples?

OR

8. Define the concept of schedule for a set of concurrent transaction. Give a suitable example.

SECTION – V

9. What is Log Based Recovery and recovery base Transactions?
OR
10. How the volatile and the non volatile storage device are differ from each other?

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II B.TECH I SEMESTER R22 REGULAR QUESTION BANK

2023-24

R22A0504: DATABASE MANAGEMENT SYSTEMS

PREVIOUS QUESTION PAPERS

R20

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   **[14M]**
        as Amazon/Flipkart. Quote your assumptions and list the requirements
        considered by you for conceptual database design for the above system.

SECTION-II

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

OR

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

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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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Supplementary Examinations, February 2022
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   a) What is a primary key? Explain how a referential integrity constraint can be used to establish relationship between tables. **[7M]**

     b) Discuss how the database can access the application programs. **[7M]**

OR

2   a) What are the core components of ER Diagrams? Illustrate the usage of components with their representations. **[7M]**

     b) List the steps involved in designing the database. Discuss briefly. **[7M]**

SECTION-II

3   a) Distinguish Relational Algebra and Relational Calculus. **[7M]**

     b) What is a nested sub query? Write SQL statements for the following queries. **[7M]**

    (i) Display the name, designation and salary of all employees whose earns salary equivalent to the minimum salary paid to the employees.

    (ii) Display the name, designation and salary of all employees whose designation is same as Taylor and who earns salary more than Taylor.

OR

4   a) Explain how to apply join for retrieving data from multiple tables. **[7M]**

     b) What is a procedure? Write a PL/SQL program to develop a procedure for finding minimum of two numbers. **[7M]**

SECTION-III

5   a) What are the types of decomposition? Distinguish lossy and lossless decomposition. **[7M]**

     b) Define the 2NF. Explain how the following relation R can be decomposed into 2NF: **[7M]**

R(ABCDEFGHIJ)
AB→C
BD→EF
AD→GH
A→I
H→J

OR

6   a) Define functional dependency. What are the different ways to identify   **[7M]**
additional functional dependencies from the set of existing functional
dependencies?

b) What is Join Dependency? Explain how it can be resolved with 5NF.   **[7M]**

SECTION-IV

7   a) Define a schedule. What are the advantages of concurrent execution of   **[7M]**
transactions? Discuss about the serial schedule.

b) Write short notes on View Serializability.   **[7M]**

OR

8   a) Explain about the validation based protocol.   **[7M]**

b) Illustrate the multiple granularity in detail with example.   **[7M]**

SECTION-V

9   a) What are the different log based recovery mechanisms? Explain   **[7M]**
briefly.   **[7M]**

b) Describe the recovery with concurrent transactions.

OR

10 a) Explain how atomicity and recovery can be achieved.   **[7M]**

b) Write short notes on checkpoints.   **[7M]**

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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.

***

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]**
[3M]

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.
iv)   Find the names of the sailors who have reserved both a Red boat and a Green boat. **[3M]**
v)   Find names of sailors who have reserved all boats.

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

<div align="center">OR</div>

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

<div align="center">

SECTION-V

</div>

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

<div align="center">OR</div>

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

<div align="center">*******</div>

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester supplementary Examinations, Nov/Dec 2018
Database Management Systems
(CSE& IT)

Roll No									

Time: 3 hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks   ********

PART – A   (25 Marks)

1. (a) Define Entity , attribute & relationship with examples. [2M]
   (b) Who is a DBA? What are the responsibilities of a DBA? [3M]
   (c) Write short notes on Schema diagram. [2M]
   (d) What is the difference between tuple relational calculus and domain relational calculus?
   (e) What meant by trivial dependency? [2M]
   (f) What is meant by normalization of data? [3M]
   (g) Write a note on Thomas write rule? [2M]
   (h) Write a short note on remote backup systems? [3M]
   (i) Define sparse index? [2M]
   (j) What are the advantages and disadvantages of indexed sequential file? [3M]

PART – B   (50 Marks)
SECTION – I
2. Explain about the Purpose of Database system &advantages of DBMS. [10M]
(OR)
3. Discuss the basic concepts of E-R Model. [10M]
SECTION – II
4. Explain about data integrity constraints. [10M]
(OR)
5. Explain about various types of JOIN operations in SQL. [10M]
SECTION – III
6. Briefly explain about 1NF, 2NF and 3NF. [10M]
(OR)
7. Write about decomposition preservation algorithm for all FD's. [10M]
SECTION – IV
8. What is Serializability? Explain its Types. [10M]
(OR)
9. Explain about ACID properties . [10M]
SECTION – V
10. Briefly explain about Organization of records in files.   [10M]
(OR)

11. Explain about Static hash function. What is the need for Dynamic Hash function? [10M]

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