

**MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATIONS,  
AUGUST -2026**

**SECOND SEMESTER**

**PAPER: MCA201-SOFTWARE ENGINEERING**

*(Under C.B.C.S Revised Regulations w.e.f. 2025-2026)*

*(Common paper to University and All Affiliated Colleges)*

**Time : 3 Hours**

**Max. Marks : 50**

Answer any **ONE** question from each unit.

**(5×10=50)**

**UNIT - I**

1. a) Explain the concept of Software Engineering and discuss its importance in software development
- b) Describe the Generic Process Framework Activities in Software Engineering with a neat diagram.

**(OR)**

2. a) Discuss the Communication and Planning activities in Software Engineering Practice.
- b) Explain Modelling Practices and their significance in Software development.

**UNIT - II**

3. a) Define System Engineering and explain the characteristics of Computer-Based Systems.
- b) Explain the system Engineering Hierarchy with a suitable example.

**(OR)**

4. a) Describe various Modeling Approaches used in Requirement Analysis.
- b) Explain Data Modeling and discuss its components with examples.

**UNIT - III**

5. a) Explain the Design Process and discuss the characteristics of good software design.
- b) Describe various Design Concepts used in Software Engineering.

**(OR)**

6. a) Define Software Architecture and explain its significance in system design.
- b) Explain different Architectural Styles and patterns used in Software Engineering.

#### **UNIT - IV**

7. a) Explain the objectives and principles of Software Testing.  
b) Discuss various Testing Strategies used in Software Engineering.

**(OR)**

8. a) Explain Basis Path Testing and illustrate it with an example.  
b) Discuss Control Structure Testing and its various techniques.

#### **UNIT - V**

9. a) Define Software Quality and explain the Software Quality Framework  
b) Discuss Product Metrics and their application in Software Engineering.

**(OR)**

10. a) Explain the W5HH Principle and its role in project planning.  
b) Discuss Software Measurement and Metrics for Software Quality.
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**MASTER OF COMPUTER APPLICATIONS DEGREE  
EXAMINATION, AUGUST -2026  
SECOND SEMESTER**

**PAPER: 202A - DATA STRUCTURES**

*(Under C.B.C.S Revised Regulations w.e.f. 2025-2026)*

*(Common paper to University and All Affiliated Colleges)*

**Time : 3 Hours**

**Max. Marks : 50**

Answer any **ONE** question from each unit.

**(5×10=50)**

**UNIT - I**

1. a) Explain Abstract Data Types and discuss their importance in Data Structures.  
b) Define Asymptotic Notations. Explain Big-O, Omega, and Theta with suitable examples.

**(OR)**

2. a) Describe the operations of Stack ADT and explain its applications.  
b) Explain Queue ADT and discuss various queue operations with examples.

**UNIT - II**

3. a) Define a Tree. Explain the terminology and properties associated with trees.  
b) Explain Binary Tree representation and discuss different tree traversal techniques.

**(OR)**

4. a) Define AVL Tree. Explain the AVL tree insertion with suitable examples.  
b) Discuss AVL tree deletion and searching operations with examples.

**UNIT - III**

5. a) Define a Graph and explain various graph representations.  
b) Explain Depth First Search traversal with an example and algorithm.

**(OR)**

6. a) Explain the applications of graphs in real-world problems.  
b) Describe Kruskal's Algorithm for finding a Minimum Cost Spanning Tree with an example.

#### UNIT - IV

7. a) Explain the Insertion Sort algorithm and analyse its time complexity.  
b) Describe Merge Sort with a suitable example and discuss its advantages.

(OR)

8. a) Explain Radix Sort and compare it with comparison-based sorting algorithms.  
b) Compare Insertion Sort, Merge Sort, Quick Sort, Heap Sort, and Radix Sort in terms of complexity

#### UNIT - V

9. a) Explain Linear Search and Binary Search algorithms. Compare their time complexities.  
b) Discuss Hash Tables and explain various hash functions used in hashing.

(OR)

10. a) Discuss Hash Indexing and its advantages in database systems.  
b) Explain B-Tree Indexing with suitable examples and operations.
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**MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATIONS,  
AUGUST - 2026**

**SECOND SEMESTER**

**PAPER : 203 A - ADVANCED DATABASE MANAGEMENT SYSTEMS**

*(Under C.B.C.S. Revised Regulations w.e.f. 2025-2026)*

*(Common paper to University and All Affiliated Colleges)*

**Time : 3 Hours**

**Max. Marks : 50**

**Answer any One question from each unit.**

**(5×10=50)**

**UNIT - I**

1. a) Explain the purpose of Database Management systems. Discuss the advantages of DBMS over file processing systems.  
b) Explain the different levels of data abstraction with suitable diagrams.

**(OR)**

2. a) Explain weak entity sets and discuss their role in database design with suitable examples.  
b) Discuss the structure of relational databases. Explain the basic concepts of relations, tuples, attributes, and keys.

**UNIT - II**

3. a) Explain nested subqueries and complex SQL queries with suitable examples.  
b) Describe SQL data types, schemas, and integrity constraints with appropriate examples.

**(OR)**

4. a) Describe exception handling, cursors, and functions in PL/SQL with examples.  
b) Explain triggers and packages in PL/SQL. Discuss their advantages and applications.

**UNIT - III**

5. a) Explain Functional Dependencies. Discuss their importance in relational database design.  
b) Describe the process of decomposition using functional dependencies with examples.

**(OR)**

6. a) Explain Multivalued Dependencies and discuss decomposition using MVDs.  
b) Describe the database design process. Explain the role of normalization in reducing redundancy and maintaining data integrity.

#### **UNIT - IV**

7. a) Explain object - based databases. Discuss their advantages over relational databases.  
b) Describe complex data types, structure types, and inheritance in SQL with suitable examples.

**(OR)**

8. a) Explain persistent programming languages and discuss their role in object databases.  
b) Describe the structure of XML documents. Explain XML document schema with examples.

#### **UNIT - V**

9. a) Explain concurrent execution of transactions. Discuss serializability and recoverability with suitable examples.  
b) Describe the implementation of isolation and explain testing for serializability.

**(OR)**

10. a) Explain lock - based concurrency control protocols with suitable examples.  
b) Explain timestamp - based concurrency protocols with suitable examples.
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**MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION,  
AUGUST - 2026**

**SECOND SEMESTER**

**PAPER : 204 A - ARTIFICIAL INTELLIGENCE**

*(Under C.B.C.S. Revised Regulations w.e.f. 2025-2026)*

*(Common paper to University and All Affiliated Colleges)*

**Time : 3 Hours**

**Max. Marks : 50**

**Answer any One question from each unit.**

**(5×10=50)**

**UNIT - I**

1. a) Explain the concept of Artificial Intelligence. Discuss its scope and applications of AI.  
b) Explain different types of agents and their characteristics with suitable examples.

**(OR)**

2. a) Differentiate between tree structures and graph structures. Explain their importance in AI search problems.  
b) Explain state space representation. Illustrate state space representation using a suitable problem.

**UNIT - II**

3. a) Explain the random search algorithm. Discuss its advantages and limitations.  
b) Describe search with open and closed lists. Explain how they improve search efficiency.

**(OR)**

4. a) What is heuristic search? Explain the role of heuristic functions in intelligent search.  
b) Explain the Best First Search algorithm with a suitable example.

**UNIT - III**

5. a) Define probability and conditional probability. Explain their significance in Artificial Intelligence.  
b) Explain Constraint Satisfaction Problems. Discuss the components and applications of CSPs.

**(OR)**

6. a) State and explain Bayes' Rule. Solve a simple problem using Bayes' theorem.  
b) Explain Bayesian Networks. Discuss their representation and construction with suitable examples.

**UNIT - IV**

7. a) Explain utility functions with suitable examples.  
b) Describe the Value Iteration algorithm used for solving Markov Decision Processes.

**(OR)**

8. a) Explain Partially Observable Markov Decision Processes. Discuss their characteristics.  
b) Discuss the applications of MDPs and POMDPs in Artificial Intelligence.

**UNIT - V**

9. a) Explain passive reinforcement learning. Discuss its objectives and working.  
b) Describe the Direct Utility Estimation method in reinforcement learning.

**(OR)**

10. a) Differentiate between passive and active reinforcement learning.  
b) Explain the Q-learning algorithm with suitable examples and applications.