

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Degree Examination, November 2025

MCS3C01– Advanced Database Management System

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

PART A**Answer any 4 questions. Each question carries 2 weightage**

1. Write note on Database Users.
2. List major characteristics of DBMS.
3. Define Functional Dependency with an example.
4. Discuss in detail ACID property in transaction management.
5. List major issues of OODBMS
6. Write a note distributed database with its need in software development.
7. State two types of relational integrity constraints.

(4x2 = 8 weightage)

PART B**Answer any four questions. Each question carries 3 weightage**

8. Explain the Three Schema Architecture of DBMS.
9. Draw an ER diagram for an online bookstore.
10. Elaborate on BCNF and 4NF with examples.
11. Differentiate conflict serializability and view serializability.
12. Compare the pros and cons of relational DBMS and OODBMS.
13. List various types of distribution in distributed databases.
14. Illustrate various constraints applied in relational model with example.

(4x3 = 12 weightage)

PartC**Answer any two questions. Each question carries 5 weightage**

15. Illustrate two-phase locking to the given transaction schedule and identify potential conflicts.
16. Normalize the following relation into BCNF:
R(A, B, C, D) with FDs {A → B, B → C, C → D}.
17. Illustrate replication, fragmentation and allocation in a distributed database scenario replication and fragmentation
18. With a neat block diagram, explain the phases of database design and implementation for large databases.

(2x5 = 10 weightage)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Degree Examination, November 2025

MCS3C02– Fundamentals of Artificial Intelligence and Machine Learning

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

Part AAnswer any *four* questions. Each carries 2 weightage.

1. Define Artificial Intelligence and explain its scope.
2. What is meant by problem reduction?
3. Differentiate between informed and uninformed search.
4. Define heuristic search. Give one example.
5. What is propositional logic? Provide one example.
6. Define Minimax procedure in game playing.
7. What is supervised learning?

(2 x 4 = 8 weightage)

Part BAnswer any *four* questions. Each carries 3 weightage.

8. Explain the characteristics of AI problems with examples.
9. Describe the Breadth First Search (BFS) algorithm with advantages and limitations.
10. Explain A* algorithm and its importance.
11. Discuss the difference between propositional logic and predicate logic.
12. Explain semantic networks with a neat example.
13. Describe expert system shells and their role in AI.
14. Explain the concept of overfitting and underfitting in machine learning.

(3 x 4 = 12 weightage)

Part C

Answer any *two* questions. Each carries 5 weightage.

15. Discuss the concept of state space search, its importance in reasoning, and different strategies.
16. Explain in detail heuristic search strategies: generate and test, hill climbing and best-first search.
17. Describe knowledge representation using rules. Compare forward and backward reasoning.
18. Explain artificial neural networks with structure, activation functions, and applications.

(5 x 2 = 10 weightage)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Degree Examination, November 2025

MCS3C03– Object Oriented Programming Concepts

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

PART A**Answer any 4 questions. Each question carries 2 weightage**

1. Differentiate attributes and methods in OOP.
2. What does /* do in Java with the help of an example?
3. How finalize () methods are used? Give an example.
4. List any four packages used in Java.
5. “Processes and threads are both units of execution, but they differ significantly in their scope, resource management, and interaction”. Comment on it.
6. Why JApplets are used in a web page?
7. What is the purpose of state diagram in UML?

(4x2 = 8 weightage)**PART B****Answer any four questions. Each question carries 3 weightage**

8. Explain about JVM and bytecode.
9. With the help of an example discuss type casting in Java.
10. How nested and inner classes are used in Java?
11. Mention the key concepts and methods involved in Inter Thread Communication
12. Write a user defined exception class to authenticate the user name and password.
13. Differentiate between Socket and ServerSocket classes in Java.
14. Discuss about deployment diagrams.

(4x3 = 12 weightage)

Part C

Answer any two questions. Each question carries 5 weightage

15. Summarize basic principles of OOP.
16. Create an interface having prototypes of functions area() and perimeter(). Create two classes Circle and Rectangle which implements the above interface. Implement a menu driven program to find area and perimeter of objects.
17. With the help of a neat diagram discuss JDBC architecture.
18. Describe about JSP life cycle in detail. List and explain each phase of the JSP life cycle with appropriate descriptions and examples.

(2x5 = 10 weightage)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Degree Examination, November 2025

MCS3E02(f) – Data ware housing and Data Mining

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

PART A**Answer any 4 questions. Each question carries 2 weightage**

1. Define a Data Warehouse. Define its importance in the data analytical process.
2. List any two OLAP operations in multidimensional data model.
3. What is data preprocessing? Give an example.
4. Differentiate between data cleaning and data reduction.
5. State the significance of support-confidence framework in association rule mining.
6. List any two ensemble classification methods.
7. Define outlier analysis with an example.

(4x2 = 8 weightage)**PART B****Answer any four questions. Each question carries 3 weightage**

8. Compare and contrast operational database systems and data warehouses.
9. Explain any two schemas for implementing a multidimensional data model.
10. What is noisy data? Explain various techniques to remove noise from data.
11. Illustrate Apriori algorithm with a suitable example.
12. Illustrate Classification by Decision Tree Induction with a suitable example.
13. With suitable examples describe the K-Means clustering algorithm.
14. What is Graph Mining? Explain the Pattern-Growth Approach for Graph Mining.

(4x3 = 12 weightage)**Part C****Answer any two questions. Each question carries 5 weightage**

15. With a neat diagram, explain the design and components of data warehouse architecture.
16. Explain with a neat diagram, the Knowledge Discovery Process in Data Mining.
17. Summarize various clustering techniques in Cluster Analysis.
18. Explain the back propagation algorithm. What are its advantages?

(2x5 = 10 weightage)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Degree Examination, November 2025

MCS3E01(b) – Introduction to Soft Computing

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

Part AAnswer any *four* questions. Each carries 2 weightage.

1. What are statistical, syntactic, and descriptive approaches in pattern recognition?
2. Define Bayes Decision Theory.
3. What are genetic operators in a genetic algorithm?
4. Define perceptron learning.
5. What are fuzzy sets? Give an example.
6. Define support vector machines.
7. What is swarm intelligence?

(2 x 4 = 8 weightage)

Part BAnswer any *four* questions. Each carries 3 weightage.

8. Explain features and feature extraction in statistical approaches.
9. Describe the concept of discriminant functions in classification.
10. Discuss the role of genetic algorithms in problem solving.
11. Explain backpropagation algorithm in neural networks.
12. Describe associative learning with an example.
13. Explain fuzzy relations with an example.
14. Write a note on harmony search in optimization.

(3 x 4 = 12 weightage)

Part C

Answer any *two* questions. Each carries 5 weightage.

15. Discuss Bayes decision theory in the continuous case with 2-category classification and error probabilities.
16. Explain in detail the working of genetic algorithms, including operators, parameters, and implementation issues.
17. Describe neural network architectures and their applications in real-world problems.
18. Explain fuzzy set theory with operations, measures, and applications in engineering.

(5 x 2 = 10 weightage)