

R4599

Sub. Code

25MAI2C1

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Artificial Intelligence and Data Science

DATA MINING AND WAREHOUSING

(CBCS – 2025 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. A _____ is designed to support decision making, data analysis, and business intelligence (BI) activities. (CO1, K1)
 - (a) Data warehouse
 - (b) DBMS
 - (c) Data Mining
 - (d) Cluster
2. Tell the name of the data model which is a core concept in data warehousing used to represent data in a way that supports fast and intuitive analysis. (CO1, K 1)
 - (a) Single
 - (b) Multidimensional
 - (c) Hyper
 - (d) KDD

3. Identify the systematic process which converts raw data into meaningful knowledge. (CO2, K1)
- (a) Data Mining
 - (b) Data Warehouse
 - (c) KDD
 - (d) Machine Learning
4. _____ improves data quality and makes it suitable for algorithms and analytical operations. (CO2, K1)
- (a) Data Preprocessing
 - (b) Data Reduction
 - (c) Data Integration
 - (d) Data Cleaning
5. _____ is commonly applied in market basket analysis. (CO3, K1)
- (a) Clustering technique
 - (b) Association Rule
 - (c) Pincer search
 - (d) Data Cleaning
6. Identify the algorithm used to train artificial neural networks by adjusting weights to minimize the error between predicted and actual outputs. (CO3, K1)
- (a) Backpropagation
 - (b) Decision Tree
 - (c) Set Counting
 - (d) Treegrowth

7. Tell the name of unsupervised learning algorithm used for clustering data into groups based on similarity.

(CO4, K1)

- (a) Association Rule
- (b) Pincer search
- (c) Mediodal
- (d) K-Means

8. What is the main characteristic of supervised learning?

(CO4, K2)

- (a) Uses unlabeled data
- (b) Uses labeled data
- (c) Finds hidden patterns without output
- (d) Does not require training

9. Text mining primarily deals with:

(CO5, K1)

- (a) Structured numerical data
- (b) Semi-structured data
- (c) Unstructured textual data
- (d) Image data

10. Big Data is characterized by:

(CO5, K1)

- (a) Volume only
- (b) Volume and Velocity
- (c) Volume, Velocity and Variety
- (d) Volume, Velocity, Variety and Veracity

Part B

(5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Illustrate Multi dimensional Data Model. (CO1, K3)

Or

- (b) Examine the features of Metadata. (CO1, K3)

12. (a) Outline the functionality of KDD. (CO2, K4)

Or

- (b) Analyze the issues and challenges in Data Mining.
(CO2, K4)

13. (a) What inference can you make in Apriori algorithm?
(CO3, K4)

Or

- (b) Select a method to discover association rule.
(CO3, K4)

14. (a) Evaluate the Clustering Paradigms. (CO4, K5)

Or

- (b) Compare supervised learning with unsupervised learning.
(CO4, K5)

15. (a) What way would you design Web Content Mining?
(CO5, K6)

Or

- (b) How would you create Life Cycle of Big data Analytics?
(CO5, K6)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Outline the Datawarehouse schema. (CO1, K4)

Or

- (b) Analyze the function of OLAP engine. (CO1, K4)

17. (a) Assess the techniques in Data mining. (CO2, K5)

Or

- (b) Compare KDD with Data Mining. (CO2, K5)

18. (a) Design the Partition algorithm with an example.
(CO3, K6)

Or

- (b) Build classification process by Back Propagation.
(CO3, K6)

19. (a) Infer K means and K Mediodal Algorithms.
(CO4, K4)

Or

- (b) Illustrate the working of NN. (CO4, K4)

20. (a) Categorize and explain the Text Mining process. (CO5, K4)

Or

(b) Outline the types of Big Data Analytics. (CO5, K4)

R4600

Sub. Code

25MAI2C2

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Artificial Intelligence and Data Science

ARTIFICIAL INTELLIGENCE AND MACHINE

LEARNING

(CBCS – 2025 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which component defines the legal moves available in a production system? (CO1, K1)
 - (a) Control strategy
 - (b) Heuristic function
 - (c) Production rules
 - (d) Goal state

2. Hill Climbing fails to find the optimal solution mainly due to: (CO1, K2)
- (a) Large state space
 - (b) Getting stuck in local maxima
 - (c) Absence of goal test
 - (d) Use of backtracking
3. Which knowledge representation method organizes information using slots and filters? (CO2, K1)
- (a) Semantic Networks
 - (b) Frames
 - (c) Predicate Logic
 - (d) Rules
4. The main difference between procedural and declarative knowledge is that declarative knowledge: (CO2, K2)
- (a) Focuses on control flow
 - (b) Cannot be modified
 - (c) Describes facts independently of usage
 - (d) Requires inference engine

5. Which types of learning uses reward and penalty as feedback? (CO3, K1)
- (a) Supervised learning
 - (b) Reinforcement learning
 - (c) Unsupervised learning
 - (d) Instance-based learning
6. Machine learning models require validation primarily to: (CO3, K2)
- (a) Increase training speed
 - (b) Ensure generalization to unseen data
 - (c) Reduce storage requirements
 - (d) Eliminate feature selection
7. Which step follows data preprocessing in the machine learning pipeline? (CO4, K1)
- (a) Feature scaling
 - (b) Data cleaning
 - (c) Model selection
 - (d) Data collection

8. Model evaluation is important because it: (CO4, K2)
- (a) Reduces data size
 - (b) Improves hardware efficiency
 - (c) Measures how well the model performs on unseen data
 - (d) Eliminate bias automatically
9. A random variable that takes countable values is called: (CO5, K1)
- (a) Continuous variable
 - (b) Discrete variable
 - (c) Independent variable
 - (d) Dependent variable
10. Bayesian learning is effective because it: (CO5, K1)
- (a) Avoids probability calculations
 - (b) Updates beliefs using new evidence
 - (c) Uses only past data
 - (d) Eliminates uncertainty

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Apply Hill Climbing algorithm to solve a simple optimization problem and explain the steps involved. (CO1, K3)

Or

- (b) Demonstrate how generate-and-test strategy can be applied to solve an AI search problem. (CO1, K3)

12. (a) Examine the Frame Problem and analyze its impact on knowledge representation. (CO2, K4)

Or

- (b) Analyze the role of resolution principle in automated reasoning systems. (CO2, K4)

13. (a) Evaluate the differences between human learning and machine learning with suitable justification. (CO3, K5)

Or

- (b) Assess the impact of data availability and quality on machine learning performances. (CO3, K5)

14. (a) Create a data pre-processing strategy for a dataset containing missing and noisy values. (CO4, K6)

Or

- (b) Construct a training and evaluation plan for improving model performance. (CO4, K6)
15. (a) Evaluate the importance of probability theory in machine learning applications. (CO5, K5)

Or

- (b) Evaluate the significance of Bayesian Belief Networks in decision-making systems. (CO5, K5)

Part C

(5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Analyze the working of Best-First Search and Hill Climbing algorithms, highlighting their advantages and limitations. (CO1, K4)

Or

- (b) Construct a constraint satisfaction formulation for an AI planning or scheduling problem. (CO1, K4)
- 17. (a) Evaluate the strengths and limitations of procedural and declarative knowledge representation. (CO2, K5)

Or

- (b) Develop a logical representation using predicate logic for a given problem domain. (CO2, K6)
- 18. (a) Evaluate the advantages and limitations of machine learning approaches in real-world applications. (CO3, K5)

Or

- (b) Design a machine learning solution for a real-world problem, specifying learning type and approach. (CO3, K6)
- 19. (a) Critically evaluate techniques used for improving model performance. (CO4, K5)

Or

- (b) Create a model improvement strategy focusing on interpretability and performance. (CO4, K6)

20. (a) Critically evaluate the effectiveness of bayesian methods in concept learning. (CO5, K5)

Or

- (b) Construct a Bayesian Belief Network for a given decision-making scenario. (CO5, K6)
-

R4601

Sub. Code

25MAI2C3

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Artificial Intelligence and Data Science

WEB TECHNOLOGIES

(CBCS – 2025 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which HTML tag is used to create a table row? (CO1, K1)
 - (a) <td>
 - (b) <tr>
 - (c) <th>
 - (d) <table>

2. JavaScript is mainly used to (CO1, K2)
 - (a) Design static pages
 - (b) Add dynamic behaviour to web pages
 - (c) Create database tables
 - (d) Compile Java programs

3. JavaBeans are primarily used to: (CO2, K1)
- (a) Create GUI
 - (b) Handle HTTP requests
 - (c) Encapsulate reusable components
 - (d) Design web pages
4. Introspection in JavaBeans helps to: (CO2, K2)
- (a) Store data permanently
 - (b) Handle database connections
 - (c) Discover bean properties and methods
 - (d) Control web sessions
5. Which web server is commonly used for running Servlets?
(CO3, K1)
- (a) IIS
 - (b) Nginx
 - (c) Apache Tomcat
 - (d) XAMPP
6. The purpose of session tracking is to: (CO3, K2)
- (a) Improve security
 - (b) Increase performance
 - (c) Maintain user state
 - (d) Reduce server load

7. JSP stands for : (CO4, K1)
- (a) JavaScript Pages
 - (b) Java Server pages
 - (c) Java Standard pages
 - (d) Java Servlet Pages
8. MVC architecture separates an application into: (CO4, K2)
- (a) Client and server
 - (b) Model, View, Controller
 - (c) HTML and Java
 - (d) JSP and Servlet
9. JDBC stands for: (CO5, K1)
- (a) Java Data Binding
 - (b) Java Distributed Control
 - (c) Java Database Connectivity
 - (d) Java Dynamic Code
10. JDBC is mainly used to: (CO5, K2)
- (a) Style web pages
 - (b) Create Servlets
 - (c) Connect Java applications to database
 - (d) Parse XML

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Apply CSS properties to improve the lay out of a web page. (CO1, K3)

Or

- (b) Apply XML structure to store employee details. (CO1, K3)

12. (a) Analyze how bound properties work in JavaBeans. (CO2, K4)

Or

- (b) Design a simple JavaBean for user authentication. (CO2, K4)

13. (a) Analyze the difference between Cookies and Sessions. (CO3, K4)

Or

- (b) Design a Servlet to handle user login. (CO3, K6)

14. (a) Analyze the limitations of Servlets that led to JSP. (CO4, K4)

Or

- (b) Design a JSP page to display student details. (CO4, K6)

15. (a) Analyze steps to connect a database using JDBC (CO5, K4)

Or

- (b) Design a JSP application using JDBC and JavaBeans. (CO5, K6)

Part C

(5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Analyze how JavaScript enables dynamic behaviour in web applications. (CO1, K4)

Or

- (b) Design an XML document for an online bookstore application. (CO1, K6)

17. (a) Analyze the working of bound and constrained properties in JavaBeans. (CO2, K4)

Or

- (b) Design a JavaBean for employee management in a web application. (CO2, K6)

18. (a) Analyze the mechanisms of session tracking in Servlets. (CO3, K4)

Or

- (b) Design a Servlet-based user authentication system. (CO3, K6)

19. (a) Analyze the JSP processing lifecycle. (CO4, K4)

Or

- (b) Design a JSP application using MVC architecture. (CO4, K6)

20. (a) Analyze the steps involved in database connectivity using JDBC. (CO5, K4)

Or

(b) Design a JSP-based database application using JDBC and JavaBeans. (CO5, K6)

R4602

Sub. Code

25MAI2C4

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Artificial Intelligence and Data Science

MOBILE APPLICATION DEVELOPMENT

(CBCS – 2025 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the questions by choosing the correct option.

1. What is a mobile application? (CO1, K2)
 - (a) A program that runs only on desktop computers
 - (b) A software application designed to run on mobile devices
 - (c) A hardware component of mobile phones
 - (d) A network protocol

2. Which platform is commonly used for publishing Android application? (CO1, K2)
 - (a) Apple App Store
 - (b) Google play Store
 - (c) Microsoft Store
 - (d) Amazon Web Services

3. Why are monolithic kernels generally less preferred than microkernels in modern mobile OS design? (CO2, K4)
- (a) Monolithic kernels consume more power
 - (b) Microkernels eliminate context switching overhead
 - (c) Monolithic kernels lack device driver support
 - (d) Microkernels improve reliability and fault isolation
4. Which techniques BEST improves application availability under poor network conditions? (CO2, K4)
- (a) Increasing UI complexity
 - (b) Implementing offline caching and synchronization
 - (c) Using higher resolution
 - (d) Encrypting all data
5. Which technique is commonly used to handle fluctuating network conditions in mobile multimedia streaming? (CO3, K4)
- (a) Static buffering
 - (b) Adaptive bitrate streaming
 - (c) Lossless compression only
 - (d) Client-side encryption
6. Advanced mobile application design increasingly relies on _____. (CO3, K4)
- (a) Device-only processing
 - (b) Heavy monolithic architectures
 - (c) Cloud-edge-device collaboration
 - (d) Platform-specific hardcoding

7. Which component is responsible for managing app resources such as layouts and strings in Android? (CO4, K2)
- (a) Activity Manager
 - (b) Resources Manager
 - (c) Package manager
 - (d) Asses Provider
8. Which class is commonly extended to manage SQLite databases? (CO4, K2)
- (a) SQLitemanager
 - (b) SQLite Helper
 - (c) SQLiteDatabase
 - (d) SQLiteOpenHelper
9. Which framework is responsible for user interface implementation in iOS? (CO5, K2)
- (a) Foundation
 - (b) UIKit
 - (c) CoreGraphics
 - (d) QuartzCore
10. Which class is used to manage Wi-Fi network connectivity status? (CO5, K2)
- (a) Wifimanager
 - (b) Reachability
 - (c) Networkcontroller
 - (d) CoreWLAN

Part B

(5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Illustrate the role of embedded system in mobile devices. (CO1, K2)

Or

- (b) Explain the need for requirement gathering in mobile application development. (CO1, K2)

12. (a) Analyze the embedded operating system influences mobile application performance. (CO2, K4)

Or

- (b) Examine to achieving quality constraints in mobile applications. (CO2, K4)

13. (a) Classify the impact of web access integration on mobile applications. (CO3, K4)

Or

- (b) Simplify the importance of design pattern for mobile applications. (CO3, K4)

14. (a) Explain the features and advantages of the Android platform. (CO4, K2)

Or

- (b) Summarize the Android applications interact with server side applications. (CO4, K2)

15. (a) Evaluate the suitability of Core Data versus SQLite for data persistence in iOS applications. (CO5, K5)

Or

- (b) Assess the effectiveness of the iPhone marketplace for application distribution. (CO5, K5)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Summarize the market trends and business factors driving mobile application development. (CO1, K2)

Or

- (b) Explain the various techniques used for validating mobile application requirements. (CO1, K2)

17. (a) Examine the various hardware and software design constraints in mobile application development.

(CO2, K4)

Or

(b) Analyze the performance, security and availability in mobile applications.

(CO2, K4)

18. (a) Categorize the concepts of integrations with GPS and social media networking in mobile applications.

(CO3, K4)

Or

(b) Examine architectural approaches for accessing cloud hosted applications from mobile devices.

(CO3, K4)

19. (a) Explain the steps involved in establishing the Android development environment.

(CO4, K2)

Or

(b) Illustrate the Google maps and WiFi enhance Android applications.

(CO4, K3)

20. (a) Evaluate different UI implementation strategies used in iOS applications. (CO5, K5)

Or

- (b) Justify the benefits and risks of integrating calendar and address book with social media in iOS applications. (CO5, K5)
-

R4603

Sub. Code

25MAI2E3

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Artificial Intelligence and Data Science

Elective: BLOCKCHAIN TECHNOLOGY

(CBCS – 2025 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** the following objective type questions by choosing
the correct option.

1. Which blockchain component stores transaction summaries inside a block? (CO1, K1)
 - (a) Timestamp
 - (b) Nonce
 - (c) Merkle Root
 - (d) Difficulty level
2. What is the primary future application area of blockchain beyond cryptocurrency? (CO1, K1)
 - (a) Gaming only
 - (b) Data backup
 - (c) Supply chain and healthcare
 - (d) Desktop publishing

3. Which type of blockchain allows anyone to participate?
(CO2, K2)
- (a) Private
 - (b) Consortium
 - (c) Public
 - (d) Hybrid
4. Which cryptocurrency feature enables cross-border transfers without banks?
(CO2, K2)
- (a) Centralized validation
 - (b) Peer-to-peer architecture
 - (c) High volatility
 - (d) Price speculation
5. What consensus algorithm is used by Bitcoin? (CO3, K1)
- (a) Proof of Stake
 - (b) Proof of Work
 - (c) PBFT
 - (d) Proof of Authority
6. Which popular public blockchain focuses on high scalability and smart contracts?
(CO3, K2)
- (a) Bitcoin
 - (b) Ethereum
 - (c) Hyperledger
 - (d) Corda

7. Why are private blockchains preferred for business applications? (CO4, K1)
- (a) They eliminate smart contracts
 - (b) They offer faster transactions and confidentiality
 - (c) They use no consensus
 - (d) They are fully anonymous
8. Which command would typically retrieve order details in an e-commerce blockchain? (CO4, K2)
- (a) Create Order
 - (b) UpperBlock
 - (c) QueryOrder
 - (d) ValidateNode
9. What is the primary goal of security in blockchain? (CO5, K1)
- (a) Increase transaction speed
 - (b) Protect data integrity and trust
 - (c) Reduce block size
 - (d) Eliminate consensus
10. The biggest challenge in applying blockchain to healthcare is _____. (CO5, K1)
- (a) Too much decentralization
 - (b) High transaction speed
 - (c) Excessive transparency
 - (d) Integration with existing systems and privacy laws

Part B

(5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) What is meant by a Blockchain solution? (CO1, K1)

Or

- (b) Tell any two future applications of Blockchain. (CO1, K1)

12. (a) Explain the different types of Blockchain with examples. (CO2, K2)

Or

- (b) Illustrate the uses of cryptocurrency in real world applications. (CO2, K2)

13. (a) Build the concept of public Blockchain to ensure data transparency in an organization. (CO3, K3)

Or

- (b) Apply the working of Ethereum Blockchain in a decentralized application. (CO3, K3)

14. (a) Judge the need for private Blockchain over public Blockchain in enterprise systems. (CO4, K5)

Or

- (b) Evaluate the impact of Byzantine Fault Tolerance in permissioned Blockchains. (CO4, K5)

15. (a) Analyze the importance of security in Blockchain systems. (CO5, K4)

Or

- (b) Examine the role of Blockchain security in healthcare data protection. (CO5, K4)

Part C

(5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Recall the concept of Blockchain with a diagram.

(CO1, K1)

Or

- (b) Show the structure of a block in Blockchain.

(CO1, K1)

17. (a) Explain the concept of decentralization and distribution in Blockchain.

(CO2, K2)

Or

- (b) Illustrate the classification of cryptocurrencies with examples.

(CO2, K2)

18. (a) Build the application of popular public Blockchain in real-world use cases.

(CO3, K3)

Or

- (b) Identity the Bitcoin Blockchain can be applied for secure online payments.

(CO3, K3)

19. (a) Determine the benefits and limitations of open source private Blockchain frameworks. (CO4, K5)

Or

- (b) Evaluate the different Algorithms of permissioned Blockchain. (CO4, K5)

20. (a) Analyze the security and privacy challenges faced by Blockchain systems and possible solutions. (CO5, K4)

Or

- (b) Examine the application of Blockchain security in banking and financial services. (CO5, K4)
-