S–3158

Sub. Code
23MCI2C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

ADVANCED DATABASE MANAGEMENT SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Differentiate entity and entity type.

2. What is BCNF?

3. Define table inheritance.

4. Give a note on commit protocols in distributed databases.

5. Write a note on recursive query.

6. List any two examples of spatial database query.

7. Explain what an XML document consists of.

8. Describe XHTML.

9. Write a brief note on temporal database.

10. What is packing and unpacking of temporal relations?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write a brief note on 4NF and 5NF.

Or

(b) Briefly explain the architecture of a parallel database system and its components.

12. (a) Explain the architecture of a distributed database system.

Or

(b) Mention the challenges of query processing in distributed databases.

13. (a) Give a brief note on predicate calculus.

Or

(b) How recursive queries are processed in deductive databases?

14. (a) Elucidate the role of XHTML.

Or

(b) Describe DTD and XML schema.

15. (a) Discuss generalizing relational operators for temporal queries.

Or

(b) How are intervals represented and manipulated in a temporal database?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the different types of parallelism (I/O, interquery, intraquery, intraoperation and interoperation) in parallel databases with examples.

17. Describe distributed data storage mechanisms in detail.

18. Elucidate the architecture and working of deductive database systems.

19. Illustrate XHTML importance in XML databases with an examples.

20. Explain multimedia database applications in areas with its benefits and challenges.

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S– 3159

Sub. Code
23MCI2C2

M.Sc DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

OPEN SOURCE TECHNOLOGIES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Give an example of an open source web server.
2. What is the main advantage of open source software?
3. What is PHP primarily used for?
4. What is processing forms?
5. What is MySQL?
6. What does SQL stand for?
7. What is Python?
8. Who developed Python?
9. What is meant by open source technology?
10. Name any two open source operating systems.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss about the Key Features of Open Source Software.

Or

(b) Explain about the Benefits of Using Open Source.

12. (a) Discuss about the basic File Operations in PHP.

Or

(b) Explain about String Manipulation techniques in PHP.

13. (a) Discuss about MySQL and web in detail.

Or

(b) In what way data can be manipulated in MySQL using PHP.

14. (a) Write about the classes and OOPs in python.

Or

(b) Discuss about execution and environment in python.

15. (a) Discuss about open source software tools in detail.

Or

(b) Write about eclipse IDE platform in detail.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about user mode and kernel mode process in open source.

17. Write about common PHP script elements in PHP.

18. Discuss in detail about retrieving data from MYSQL.

19. Explain in detail about error and exceptions in PYTHON.

20. Discuss in detail about model driven architecture tools in open source technologies.

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S–3160

Sub. Code
23MCI2C3

M.Sc DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

COMPILER DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is syntax?

2. Define white space.

3. What is symbol table?

4. What is parser?

5. What is Syntax Directed Translation (SDT)?

6. Define Top-Down translation.

7. What is run-time environment in compiler design?

8. What is intermediate code in compiler design?

9. What is flow graph?

10. What is code optimization?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain about removal of white space and comments in compiler design.

Or

(b) Discuss about the recognition of tokens in compiler design.

12. (a) Explain about the list data structure for symbol table.

Or

(b) Discuss about the role of parser in complier design.

13. (a) Explain how translators can be optimized.

Or

(b) Discuss about top-down translation in detail.

14. (a) Enumerate about Intermediate Languages in Compiler Design in detail.

Or

(b) Explain Storage Organization in Compiler Design

15. (a) Discuss about run time storage management in detail.

Or

(b) Explain in detail about the loops in flow graph.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the role of a lexical analyzer and explain how tokens are recognized using regular expressions and finite automata.

17. Explain the concept and role of a symbol table in compiler design.

18. What is syntax-directed definition? Explain synthesized and inherited attributes with suitable examples.

19. Explain in detail about Intermediate Code Generation in Compiler Design.

20. Discuss about the issues in design of code generation in detail.

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S–3161

Sub. Code
23MCI2E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

Elective – SOFTWARE TESTING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Name two types of software testing.

2. What is a test case?

3. What is the difference between verification and validation?

4. What is SDLC?

5. What is white box testing?

6. Define black box testing.

7. Define regression testing

8. What is GUI?

9. What is testing management?

10. Define test automation.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss about model driven test design in detail.

Or

(b) Explain in detail software testing foundations.

12. (a) Write about the phases of software project.

Or

(b) Discuss in detail about iterative model.

13. (a) Discuss about bottom up integration in software testing.

Or

(b) In what way scenario testing helps in software testing.

14. (a) Explain about embedded software in detail.

Or

(b) Discuss about integration and testing can be done in a project.

15. (a) Explain in detail about software test automation.

Or

(b) Discuss about role of the ecosystem in detail.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the testing levels based on software activity in detail.

17. Discuss about waterfall model with a neat diagram.

18. Explain in detail about performance testing in software testing.

19. Discuss about the common people issues in testing the software.

20. Explain about the comparison between testing and development functions.

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S–3162

Sub. Code
23MCI2E2

M.Sc DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

Elective – INTERNET OF THINGS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Internet of Things (IoT).

2. What is IoT functional stack?

3. What is a smart object?

4. Define actuator.

5. What is IEEE 802.15.4?

6. Define constrained node.

7. What is IPv6 optimization for IoT?

8. What is CoAP?

9. Define edge analytics.

10. What is activity monitoring in IoT?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the genesis of IoT and its digitization impact.

Or

(b) Describe about IoT network architecture and design principles.

12. (a) Explain about sensors and sensor networks in IoT.

Or

(b) Describe the communication criteria and access technologies for IoT.

13. (a) Explain the need for adaptation of Internet Protocol for IoT.

Or

(b) Describe about constrained networks and their challenges.

14. (a) Explain about transport layer methods used in IoT applications.

Or

(b) Describe about MQTT protocol and its features.

15. (a) Explain the functions of data analytics tools and techniques for IoT.

Or

(b) Describe about network analytics and IoT security issues.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about IoT architecture and challenges in detail.

17. Explain about smart objects and actuators with examples.

18. Describe about IP as IoT network layer and optimization techniques in detail.

19. Explain about IoT application layer protocols with CoAP and MQTT.

20. Discuss about IoT data analytics and how it is applied in real-world.

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S– 3163

Sub. Code
23MCI2E3

M.Sc DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

Elective – CLOUD SERVICES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. State the purpose of cloud architecture.

2. What is meant by cloud storage?

3. What is the purpose of Google App Engine.

4. Define Software as a Service.

5. Mention the benefits of cloud computing for community activity.

6. Define cloud-based to-do list collaboration.

7. Name the tools used for cloud event management

8. Define cloud-based task management

9. Differentiate between blogs and wikis.

10. Define web mail service with an example.

Part B (5 × 5 = 25)

Answer **all** the questions by choosing either (a) or (b).

11. (a) Illustrate the basic components of cloud architecture and their roles.

Or

(b) Explain how cloud storage supports modern business applications.

12. (a) Explain the role of web services in developing cloud applications.

Or

(b) Describe Amazon EC2 and its significance in on-demand computing.

13. (a) Describe the process of collaborating on schedules using cloud tools.

Or

(b) Explain the significance of cloud complains for corporate collaboration.

14. (a) Discuss collaborative contact management in cloud environment.

Or

(b) Explain how cloud enables collaborative word processing and databases.

15. (a) Describe the role of social networks and groupware in online collaboration.

Or

(b) Explain the features of web-based communication tools used for collaboration.

Part C

(3 × 10 = 30)

Answer any **three** of the following.

16. Design a cloud-based storage solution for a small business and justify the choice of services.

17. Create a framework for discovering and selecting cloud services for a start-up organization.

18. Design a cloud-based collaboration model for a university department to manage schedules, contacts and events.

19. Evaluate the effectiveness of cloud-based scheduling, task management, and event management for a business organization.

20. Create a model for online collaboration using web-based communication and conferencing tools for a remote team.

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S–3164

Sub. Code
23MCI2S1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science and Information Technology

WEB TECHNOLOGIES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is XHTML?

2. Define phrase elements in HTML.

3. What is an image map?

4. Define nested tables.

5. What is <iframe>?

6. What is CSS box model?

7. Define pseudo-class.

8. What is a JavaScript data type?

9. Define alert box.

10. What is a browser object?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the basic text formatting and presentation elements in HTML.

Or

(b) Describe about links and navigation techniques in web pages.

12. (a) Explain the creation and grouping of tables with examples.

Or

(b) Describe about HTML forms and form controls.

13. (a) Explain the different ways of applying CSS to a web page.

Or

(b) Describe about CSS selectors and their usage.

14. (a) Explain above JavaScript control structures with examples.

Or

(b) Describe about JavaScript dialog boxes and their uses.

15. (a) Explain above JavaScript window and document objects.

Or

(b) Describe about event handling in JavaScript.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the structure of an HTML document and core elements.

17. Discuss about forms, frames, and their applications in web design.

18. Explain about CSS positioning and design issues in web applications.

19. Describe about JavaScript functions and message boxes with examples.

20. Explain about JavaScript objects and form validation techniques in detail.

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S– 3165

Sub. Code
23MCI3C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science and Information Technology

DATA SCIENCE & MACHINE LEARNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is a probability distribution?

2. Why is model validation important in data science?

3. What is Exploratory Data Analysis?

4. Name the basic tools used in data analysis.

5. What is feature extraction in machine learning?

6. Define user retention in the context of data-driven applications.

7. Define version space in concept learning?

8. Shat is inductive bias in machine learning?

9. What is Bayesian learning?

10. Define the Minimum Description Length principle.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss the process of model selection and evaluation in data science.

Or

(b) Describe the role of statistical modeling in data science.

12. (a) Explain the K-Means clustering algorithm and its applications.

Or

(b) Explain the steps of the data science process in detail.

13. (a) Describe the key components of a recommendation system and explain the role of collaborative filtering and content-based filtering.

Or

(b) Compare and contrast filter and wrapper methods with examples.

14. (a) Discuss the working of the candidate elimination algorithm with an example.

Or

(b) Discuss the advantages and limitations of decision tree learning.

15. (a) Explain the Gibbs algorithm and its role in probabilistic learning.

Or

(b) Compare and contrast Maximum Likelihood Estimation and the Minimum Description Length principle.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain datafication in detail, including its benefits, challenges, and examples

17. Describe the working of K-Nearest Neighbors with example.

18. Explain Principal Component Analysis with real-world applications.

19. Explain heuristic space search and its application to decision tree learning.

20. Describe Bayesian Belief Networks and their role in probabilistic reasoning with a case study.

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S– 3166

Sub. Code
23MCI3C2

M.Sc DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science and Information Technology

ADVANCED WEB TECHNOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. How to set background image in HTML?

2. How to set the width and height of an image using HTML?

3. What is Introspection?

4. Define constructor.

5. Is AJAX frontend or backend?

6. What is the difference between AJAX and XML?

7. What is Node.js and Where can you use it?

8. Why use Node.js?

9. What is the main purpose of Angular?

10. What is an NgModule?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain about HTML and its components in detail.

Or

(b) Explain about Cascading Style Sheets with an example.

12. (a) Explain in detail about encapsulation with an example.

Or

(b) Discuss how database can be accessed using PHP and how the state can be maintained.

13. (a) Explain about XML document structure in detail.

Or

(b) Discuss about XML parser with an example.

14. (a) Discuss about rich module ecosystem in detail.

Or

(b) Explain in detail about file serving in Node js.

15. (a) Discuss about angular features and its advantages in detail.

Or

(b) Explain about component communication happen in angular Js.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain Document Object Model with suitable examples and code.

17. Explain database connectivity in PHP with reference to MYSQL.

18. Explain the procedure for validating the XML Documents

19. Discuss about front-end and back-end java script in Node js.

20. Differentiate between angular Js and angular in detail.

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S– 3167

Sub. Code
23MCI3C3

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science and Information Technology

DISTRIBUTED OPERATING SYSTEM

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define process synchronization.

2. Differentiate between consumable and reusable resources?

3. Define Lamport's logical clock.

4. Write a note on communication primitives in a distributed OS?

5. What is distributed resource management?

6. List down the mechanisms used in distributed file systems.

7. Write down the role of checkpointing in distributed database systems?

8. What is the purpose of voting protocols in distributed systems?

9. Define multiprocessor operating system?

10. What is reliability in an operating system?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Illustrate the layered design approach of an operating system with a neat diagram.

Or

(b) Explain in detail the four necessary conditions for a deadlock to occur.

12. (a) Discuss Lamport's logical clock and its importance in distributed systems.

Or

(b) Discuss the role of distributed mutual exclusion in distributed systems.

13. (a) Describe the design issues in distributed resource management.

Or

(b) Explain the protocols used in distributed shared memory systems.

14. (a) State the key approaches to failure recovery in distributed computing.

Or

(b) Compare and contrast synchronous and asynchronous checkpointing.

15. (a) Explain different structures of multiprocessor operating systems.

Or

(b) Discuss the design issues laced in multiprocessor OS development.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Compare and contrast different process synchronization mechanisms like semaphores, mutexes and monitors.

17. Discuss different methods of termination detection in a distributed system with examples.

18. Outline different load balancing techniques used in distributed scheduling.

19. Describe different failure classifications in distributed system.

20. Describe memory management strategies used in multiprocessor systems.

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S–3168

Sub. Code
23MCI3E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science and Information Technology

Elective – BLOCK CHAIN TECHNOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is decentralization in blockchain?

2. Define Smart Contract.

3. Give a note on Public key Cryptography.

4. List out the Foundations of Cryptography.

5. Describe Bitcoin.

6. Write a note on Litecoin.

7. Define Ether.

8. Explain Wallet in Ethereum.

9. How does Health supports in Blockchain?

10. What are the Privacy in Blockchain?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write down the Methods of Decentralization with its diagram.

Or

(b) Explain Blockchain and full ecosystem Decentralization in detail.

12. (a) Describe primitives Cryptographic with an example.

Or

(b) Discuss the Asymmetric Cryptography and with its program.

13. (a) What is an alternative bitcoin? Give an example.

Or

(b) Write a detailed note on Namecoin with its diagram.

14. (a) Briefly discuss the client and Wallet in Smart Contracts.

Or

(b) List out the network of Ethereum in detail.

15. (a) Elaborate Alternative Blockchain with an example.

Or

(b) How does Finance works in blockchain? Explain with an example.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the routes and application of Decentralization.

17. Differentiate Public and Private Keys with an example.

18. Discuss any three types of bitcoin with a suitable example.

19. What are the security issues used in blockchain? Give an example.

20. Elucidate the challenges of scalability in blockchain.

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S–3171

Sub. Code
23MCI3S1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science & Information Technology

E-COMMERCE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define EDI.

2. Define media convergence.

3. Define Last mile.

4. What is global information distribution network in e commerce?

5. What is Internet terminology?

6. What is the terminology of intranet?

7. Why is e-payment important?

8. What is Credit card?

9. What is cellular data?

10. What are different types of applications in which mobile computing is used?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write about Electronic commerce organizations Applications in detail.

Or

(b) Write the advantages and disadvantages of E-Commerce.

12. (a) List out the ways of forces influencing the I-Way.

Or

(b) Briefly discuss network access equipment in E-Commerce.

13. (a) What is Internet Governance? Explain the types of Interaction in e-Governance.

Or

(b) Explain about the internet society in E-Commerce.

14. (a) Explain the advantages of Electronic Payment System.

Or

(b) Discuss the way of creating a payment processing system?

15. (a) Explain about mobile computing applications.

Or

(b) What are cellular data communication protocols? List out the protocols in a data Communication system?

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the Electronic Commerce Framework.

17. Write a detailed note on public policy issues shaping the I-Way.

18. What are the National Research and Education Network? Explain its functions.

19. Discuss about smart card and electronic payment system.

20. Describe about cellular data communication protocols.

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S–3172

Sub. Code
23MCI4C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science and Information Technology

SOFT COMPUTING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is a fuzzy set?

2. Name any two functions on fuzzy sets.

3. Define artificial neural network (ANN).

4. What is supervised learning in neural networks?

5. Mention the main learning rule used in the Perceptron network.

6. Describe Backpropagation.

7. What is the extension principle in fuzzy logic?

8. Express fuzzy reasoning.

9. Define genetic algorithm.

10. Write the purpose of the fitness function in GA.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Differentiate crisp sets and fuzzy sets with example.

Or

(b) Write short notes on fuzzy composition.

12. (a) Explain the scope and applications of artificial neural networks.

Or

(b) Describe the McCulloch-Pitts neural model.

13. (a) Describe the structure and working of the Madaline network.

Or

(b) Write about the concept of Bidirectional Associative Memory.

14. (a) Explain the extension principle with an example.

Or

(b) What are fuzzy measures? How are they different from probability measures?

15. (a) Differentiate traditional algorithms and genetic algorithms.

Or

(b) Elucidate the process and purpose of mutation in GA.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain membership functions, their features, and methods of assigning membership values.

17. Write the different learning methods in artificial neural networks with examples.

18. Describe the architecture and working of the Hopfield network. What are its limitations?

19. Elucidate fuzzy logic control systems and their applications.

20. Write down the genetic algorithm process in detail.

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S–3173

Sub. Code
23MCI4C2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science and Information Technology

MOBILE COMMUNICATIONS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Mention any two advantages of mobile computing.

2. Name two types of mobile networks.

3. What is bandwidth?

4. State two types of transmission media used in telecommunication.

5. Name two standards used in WLAN.

6. Name any two devices used in a WLAN.

7. What is the function of the transport layer in mobile communication?

8. Name two protocols used at the transport layer.

9. What is File system?

10. Define WDP.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Enumerate the importance of need for mobile computing.

Or

(b) Discuss in detail about multiplexing.

12. (a) Discuss the Key Features of DECT.

Or

(b) What is UMTS? Explain the Key Features of UMTS.

13. (a) List out the role of the network layer in packet switching.

Or

(b) Explain the design issues and functions of the Network Layer.

14. (a) Explain how TCP performs in mobile environments.

Or

(b) List and explain different transport protocols used in mobile networks.

15. (a) Discuss about the Application Layer.

Or

(b) Explain in detail about the Key Application Layer Protocols.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the architecture of Mobile Computing.

17. Explain in detail the components and working of a telecommunication system.

18. What is Routing? Describe different routing algorithms used at the network layer.

19. Discuss about the limitations and Security Issues of mobile transport layer.

20. Illustrate about the main components of WAP Architecture.

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S–3174

Sub. Code
23MCI4C3

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science and Information Technology

BIG DATA ANALYTICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Data Analytics.

2. What is HDFS?

3. What is MapReduce?

4. Define Hadoop.

5. What is regression?

6. Define SVM.

7. What is sampling data?

8. What is RTAP?

9. What is NoSQL?

10. Mention two examples of NoSQL databases.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss about the challenges of conventional system.

Or

(b) Differentiate between analysis vs reporting.

12. (a) Discuss about the Key Features of Hadoop.

Or

(b) Explain about Hadoop YARN in detail.

13. (a) Explain about multivariate analysis.

Or

(b) Discuss about how density based methods helps in data analysis.

14. (a) Explain about stream data model in detail.

Or

(b) Explain in detail about sampling chain a stream.

15. (a) Discuss about the Features of NoSQL Databases.

Or

(b) Explain in detail about Types of NoSQL Databases.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about Components of Hadoop Ecosystem in detail.

17. Explain in detail about matrix-vector multiplication.

18. Explain how high dimensional data can be clustered in big data analysis.

19. Discuss about real time analytics platform in detail.

20. What is HiveQL? Explain the functions of HiveQL in big data.

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