S–3391

Sub. Code
23MCE1C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

First Semester

Computer Science

ANALYSIS AND DESIGN OF ALGORITHMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is asymptotic notation? Give two examples.

2. Define recursive Algorithm.

3. What is strassen's matrix multiplication?

4. Write the difference between Prim's and Kruskal's algorithm.

5. How to compute a binomial coefficient for recursive formula?

6. Define the principle of optimality.

7. What is the subset sum problem?

8. Write the state-space free for 4-Queen's problem.

9. Give two examples of NP-complete problems.

10. Define P and NP problem.

Part B (5 × 5 = 25)

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

11. (a) Explain the fundamental steps of Algorithmic problem solving with an example.

Or

(b) Compare Bi-O, Big-Ω and Bi-θ notations with examples.

12. (a) Apply Kruskal's algorithm to find the minimum Spanning Tree of a given graph.

Or

(b) Explain divide and conquer technique with the multiplication of large integers.

13. (a) Explain computing binomial coefficients using Dynamic programming.

Or

(b) Solve the knapsack problem using memory function approach.

14. (a) Apply backtracking to solve the Hamiltonian circuit problem.

Or

(b) Explain the subset sum problem with an example.

15. (a) Distinguish between P, NP and NP-complete problems.

Or

(b) Describe the approximation approach for the knapsack problem.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Perform mathematical analysis of recursive and non-recursive matrix multiplication algorithms.

17. Describe and analyze Prim's algorithm for minimum Spanning Tree with an example.

18. Discuss Floyd's algorithm in detail with step-by-step illustration on a weighted graph.

19. Explain Traveling salesman problem using Branch and Bound with an example.

20. Discuss approximation algorithms for NP-hard problems with suitable examples.

———————

S–3392

Sub. Code
23MCE1C2

M.Sc. DEGREE EXAMINATION, APRIL 2026

First Semester

Computer Science

OBJECT ORIENTED ANALYSIS AND DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Inheritance?

2. Define candidate key.

3. What is a nested state diagram?

4. Differentiate functional and dynamic model.

5. Define a problem statement with an example.

6. What is the main purpose of analysis in system development?

7. Give advantages of system design.

8. What do you mean by boundary conditions?

9. Define physical packaging.

10. Write the role of design optimization.

Part B (5 × 5 = 25)

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

11. (a) Explain briefly the concept of links and associations in object modeling.

Or

(b) Discuss the importance of abstract classes in object modeling.

12. (a) Draw a simple state diagram for a telephone system.

Or

(b) Explain the relationship of functional to object and dynamic models.

13. (a) Describe the importance of adding operations during analysis.

Or

(b) Explain the steps involved in object modeling during analysis.

14. (a) Write short notes on architectural frameworks in system design.

Or

(b) Explain briefly about management of data stores.

15. (a) Describe briefly the importance of documenting design decisions.

Or

(b) Exemplify the concept of combining the three models in object design.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail about advanced object modeling with example.

17. Develop a simple functional of model for an online ordering system using Data Flow Diagram (DFD).

18. Prepare a detailed analysis of an ATM system, highlighting object, dynamic and functional model.

19. Explain the architecture of ATM system with a neat diagram.

20. Discuss the process of object representation, physical packaging and document design decision with examples.

———————

S–3393

Sub. Code
23MCE1C3

M.Sc. DEGREE EXAMINATION, APRIL 2026

First Semester

Computer Science

PYTHON PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Give any four escape sequences and their meanings.

2. Write the purpose of break statement.

3. What does chdir (path) perform?

4. Recall recursion.

5. What is the purpose of –unit– method?

6. Mention the standard input device for terminal and GUI based programs.

7. Mention the Django run server URL.

8. Give the basic structure of the Django application.

9. What is a Django view?

10. What does HTTP 404 refers?

Part B (5 × 5 = 25)

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

11. (a) Write in detail mixed mode arithmetic and type conversion.

Or

(b) How does for loop supports definite iteration? Explain.

12. (a) Demonstrate operations on strings.

Or

(b) Explain text file and file operations.

13. (a) Write a note on structuring classes with inheritance and polymorphism.

Or

(b) Explore the details of windows and window components.

14. (a) How to make your computer ready for Django Project?

Or

(b) How to do Django project settings?

15. (a) How to create model managers? Explain.

Or

(b) Elaborate Querysets.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain if statement and their variants with example.

17. Discuss strings and number systems with examples.

18. Demonstrate two dimentional grid as a new data structure.

19. How to design the blog data schema using Django.

20. Build list and detail views.

———————

S–3394

Sub. Code
23MCE1E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

First Semester

Computer Science

Elective – ADVANCED SOFTWARE ENGINEERING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Software Engineering.

2. Sketch out the various software development process models.

3. What is meant by system requirements?

4. What are features of good SRS?

5. What is a person month?

6. Write about ISO 9000.

7. Give the contents of data dictionary.

8. What is the use of class diagram?

9. Recall unit testing.

10. Write about reverse engineering.

Part B (5 × 5 = 25)

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

11. (a) Write a short note on Problem domain.

Or

(b) Draw and Explain prototype model.

12. (a) Give an account on types of requirements.

Or

(b) Exemplify algebraic specification.

13. (a) Give an account on Design guidelines.

Or

(b) How does function point computation performed?

14. (a) How to characterize a good software design?

Or

(b) Write a note on testing.

15. (a) Give a brief note on bug priority and severity

Or

(b) How to develop a Test Case?

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss shortly ETVX approach for process specification.

17. Give a detailed note on models for staffing level estimation.

18. Elaborate coupling and cohesion.

19. Discuss Integration Testing.

20. Explain in detail data design using E-R diagram.

———————

S–3396

Sub. Code
23MCE2C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science

DATA MINING AND DATA WAREHOUSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Mention any four application oriented database systems.

2. What do you meant by outliers?

3. What does data cube allows?

4. List out the data warehouse models.

5. Write the equation of confidence $(A \rightarrow B)$.

6. Give the range of learning rate.

7. Find the Eulcidean distance of (1,2) (3, 5).

8. What are the applications of outlier detection?

9. What are all multimedia data?

10. What is phishing page?

Part B (5 × 5 = 25)

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

11. (a) Explain in detail knowledge discovery as a process.

Or

(b) Justify that the scatter plot in one of the most effective graphical methods.

12. (a) Describe OLAP operations in the multi dimensional data model.

Or

(b) Sketch out the usage of data warehouse.

13. (a) Write about the variations of Apriori algorithm.

Or

(b) Write an account on Rough Set Approach.

14. (a) Explain the K-means partitioning algorithm.

Or

(b) List the advantages of DENCLUE than others.

15. (a) Explain the approaches used for similarity based retrieval in image databases.

Or

(b) Explain text analysis.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Summarize major data mining issues.

17. A data cube is a lattice of cuboids. Justify.

18. Demonstrate mining frequent term sets without candidate generation.

19. Discuss Hierarchical methods.

20. How can a search engine automatically identify authoritative web pages? Explain.

———————

S–3397

Sub. Code
23MCE2C2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science

PRINCIPLES OF COMPILER DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define cross compiler.
2. Give the Regular expression for an identifier.
3. List out the types of parsing.
4. Define context free grammar.
5. Give the types of intermediate code Representation.
6. How to implement three address instruction?
7. List out the Data Structure used to represent symbol table.
8. Differentiate between static and dynamic storage allocation.
9. Define flow graph.
10. What is peephole optimization?

Part B (5 × 5 = 25)

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

11. (a) Write a short notes on cousins of compiler.

Or

(b) Explain about the role of lexical analyzer.

12. (a) Explain about stack implementation of shift reduced parsing for the string id+id*id.

Or

(b) Explain about recursive descent parsing.

13. (a) Write a short notes on syntax directed translation scheme.

Or

(b) Briefly explain about translation of assignment statements.

14. (a) Write a short notes on runtime storage management.

Or

(b) Briefly explain about Error Recovery.

15. (a) Explain about DAG representation of Basic Block.

Or

(b) Write a short notes on Register allocation and assignment.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the different phases of compiler with example.

17. Discuss in detail about Top-down parsing with example.

18. Describe about statements that alter the flow of control.

19. Discuss the content of a symbol table.

20. Explain in detail about transformation of Basic Blocks.

———————

S–3398

Sub. Code
23MCE2C3

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science

ADVANCED JAVA PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the purpose of the import statement in Java?

2. What is the purpose of the Socket class in Java?

3. What is the role of the remote interface in RMI?

4. What is Java Spaces?

5. What is the purpose of the prepared statement interface in JDBC?

6. What is BLOBs? State its use.

7. State the use of CGI.

8. List out the types of JSP directives.

9. How do you create a JAR file using the Java Development Kit?

10. What is the purpose of Java's reflection API and how is it used?

Part B ($5 \times 5 = 25$)

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

11. (a) Explain about Event source, event object and event listener in Java.

Or

(b) Explain how images are loaded and displayed in Java using AWT.

12. (a) Explain about the steps involved in creating a Java RMI application.

Or

(b) Write short notes on stubs and skeletons in RMI.

13. (a) Explain the steps involved in connecting a Java application with a database using JDBC.

Or

(b) Explain how databases are used in web applications with suitable examples.

14. (a) Explain about the working of cookies in maintaining session state.

Or

(b) Discuss about the different types of scripting elements in JSP.

15. (a) Discuss on the role of locale and resource bundle in java internationalization.

Or

(b) Explain the role of JFrame, JButton, JLabel in swing with examples.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the role of Socket, SererSocket and InetAddress classes with examples.

17. Write a java program to serialize and deserialize an object & explain each step.

18. Discuss the process of stoning and retrieving images, audio and video in a Java-based multimedia database.

19. Write a servlet program to handle a client request and generate a dynamic HTML response and explain it.

20. Discuss about Event handling in swing with example.

———————

S–3399	Sub. Code 23MCE2E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science

Elective — ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. List down any two issues in handling AI.

2. What is meant by AI?

3. Define inheritable knowledge.

4. Write down any two algorithms related to best-first search.

5. Define declarative knowledge.

6. What is predicate logic?

7. Tell – natural deduction.

8. Define machine learning.

9. Write down any two machine learning applications.

10. What is the role of data preparation in ML?

Part B (5 × 5 = 25)

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

11. (a) Write a note on heuristic function.

Or

(b) Write down the algorithm to check the duplicate nodes.

12. (a) Explain mutilated checker board problem.

Or

(b) Write a note on the frame problem.

13. (a) Compare forward and backward reasoning.

Or

(b) Explain ISa relationships in predicate logic.

14. (a) Discuss the importance of hybrid cloud.

Or

(b) How big data helps in machine learning?

15. (a) Assess the impact of machine learning in daily activities.

Or

(b) How does ML impact financial decision making?

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Summarize – "AI problems".

17. Explain simple hill climbing with algorithm.

18. Describe in detail about logic programming.

19. Discuss the role of data mining in machine learning.

20. Illustrate the phases in machine learning cycle.

———————

S–3400

Sub. Code
23MCE2E2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Computer Science

Elective – BLOCK CHAIN TECHNOLOGIES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is meant by distributed ledger technology.
2. Define digital identity.
3. State one privacy issue in block chain.
4. Define mining mechanism.
5. What is cryptography?
6. Tell about digital signature.
7. Define cryptoeconomics.
8. What is significance of regulation in preventing fraud?
9. Write down few applications of block chain in health care.
10. What is machine –to-machine communication?

Part B (5 × 5 = 25)

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

11. (a) Explain the importance of digital identify in block chain systems.

Or

(b) Compare bitcoins and cryptocullencies.

12. (a) Differ block chain from conventional distributed databases.

Or

(b) Write a note on security issues in block chain.

13. (a) Explain how cryptography ensures trust in cryptocurrency transactions.

Or

(b) Write a note on public key cryptography.

14. (a) How exchange of cryptocurrency works?

Or

(b) Write a short note on stack holders in cryptoregulation.

15. (a) Discuss future opportunities in block chain.

Or

(b) Explain the health care costs in block chain.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the major application of block Chain.

17. Explain in detail the evolution of block chain 1.0 to 3.0.

18. Evaluate the role of cryptography in making cryptocurrency secure and reliable.

19. Analyze the roots of bitcoin and the need for regulation.

20. Elaborate block chains potential in data management in industry 4.0.

———————

S–3401	Sub. Code
	23MCE3C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science

DIGITAL IMAGE PROCESSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What are the fundamental steps in Digital Image processing?

2. Name any two basic relationships between Pixels.

3. Define histogram processing.

4. What is the difference between smoothing and sharpening spatial filters?

5. Define noise models in the context of image restoration.

6. What is the purpose of inverse filtering in image restoration?

7. Differentiate between lossless and lossy compression.

8. What are the key elements of an image compression model?

9. What is image segmentation and why is it important?

10. Mention two applications of motion based segmentation.

Part B ($5 \times 5 = 25$)

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

11. (a) Explain the origin and digital image processing and its historical significance.

Or

(b) How does image sensing and acquisition work? Explain with an example.

12. (a) How does histogram equalization improve image contrast?

Or

(b) Describe the working of smoothing spatial filters and their applications.

13. (a) How does spatial filtering help in noise removal? Provide an example.

Or

(b) Describe the process of periodic noise reduction using frequency domain filtering.

14. (a) Explain briefly the fundamentals of image compression.

Or

(b) What are the advantages and disadvantages of lossy compression?

15. (a) Describe the process of edge linking and boundary detection.

Or

(b) Compare region-based segmentation and thresholding methods.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the elements of visual perception and their role in image processing.

17. Explain sharpening spatial filters in detail with examples and their significance in image processing.

18. Describe various types of filtering techniques used for image restoration.

19. Discuss various image compression standards and compare their performance.

20. Explain motion-based segmentation and its applications in real world scenarios.

———————

S–3402

Sub. Code
23MCE3C2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science

CLOUD COMPUTING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define the term Cloud Computing.

2. Mention any two usages of Cloud Computing?

3. Define the term E-Mail.

4. What is meant by a Module?

5. Define Database.

6. List down any two Cloud Collaboration services?

7. Expand WWW?

8. What is meant by Internet?

9. How photo sharing communities works?

10. Mention any two Photo Editing Tools?

Part B (5 × 5 = 25)

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

11. (a) Write a short note on the Pros and Cons of Cloud Computing?

Or

(b) Write about the process of Cloud Computing.

12. (a) Write about the uses of e-Mail Communications during a Project.

Or

(b) Write the concept of Cloud Computing for Corporates.

13. (a) Write about the concept of Cloud Services on Event Management.

Or

(b) Explain the need for Cloud services on word processing for Project Documentation.

14. (a) Write a note on the uses of Social Media.

Or

(b) Mention any two features of G-Mail with example.

15. (a) Write a note on the importance of file storage.

Or

(b) Mention the benefits of Webinar over Seminar.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the services of Cloud Computing in detail.

17. Summarize the phrase 'Cloud Computing for Everyone'.

18. Write a note on the collaboration on Contact Management.

19. Explain the stages involved in the conduct of a Webinar.

20. Describe the need for Cloud Storage.

———————

S–3403

Sub. Code
23MCE3C3

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science

DATA SCIENCE AND ANALYTICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is data science?

2. List two advantages of using data science in business.

3. Mention two steps in the data analytics life cycle.

4. What is meant by machine learning?

5. Define attributes and datatypes.

6. Tell about K-means algorithm.

7. Define association rules.

8. What is a decision tree?

9. Define Term Frequency (TF).

10. What is linear regression?

Part B (5 × 5 = 25)

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

11. (a) Write a short notes on v.s of big data.

Or

(b) How does data science transform industries?

12. (a) Write short notes on key steps in data analytics life cycle.

Or

(b) Explain the role of visualization in data analytics.

13. (a) Elaborate the importance of clustering in analytics.

Or

(b) Discuss shortly on exploratory data analysis.

14. (a) Explain Bayes theorem.

Or

(b) Discuss about decision tree limitations.

15. (a) Write a short note on text analysis.

Or

(b) Explain logistic regression.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write a detailed note on the applications of data science in real world domains.

17. Explain how ML helps in predictive analysis.

18. Elaborate K-means algorithm with use-case in detail.

19. Write a detailed note on association rules.

20. Discuss TF-IDF method in detail.

S–3404

Sub. Code
23MCE3E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science

Elective: NETWORK SECURITY AND CRYPTOGRAPHY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define cryptography.

2. List any two security services.

3. Define Digital signatures.

4. What is hash function?

5. Talk about Kerberos.

6. Expand PGP.

7. List down the steps involved in password security.

8. Who is intruder?

9. Define water marking.

10. What is meant by steganography?

Part B (5 × 5 = 25)

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

11. (a) Compare Symmetric and Asymmetric Key cryptosystems.

Or

(b) Describe RC5 algorithm.

12. (a) Explain about RSA algorithm.

Or

(b) How public key cryptosystem works?

13. (a) Write a note on S/MIME.

Or

(b) Write down the impact of using authentication.

14. (a) Talk about VIRUS.

Or

(b) Explain about the steps involved in System security.

15. (a) Write a java program to implement RSA.

Or

(b) Assess the importance of network forensic.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain AES in detail.

17. Write a detailed note on Elliptic Curve crypto system.

18. Explain in detail about X.509 Authentication Services.

19. Describe about Secure Socket Layer (SSL).

20. Assess the usage of security Audit.

———————

S–3405	Sub. Code 23MCE3E2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Computer Science

Elective – ADVANCED INTERNET OF THINGS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is the role of sensors in IoT architecture?

2. Mention any two security challenges in IoT.

3. What is the significance of a microcontroller in IoT devices?

4. What is Pulse Width Modulation (PWM)?

5. What does the delay (1000); function do in an Arduino sketch?

6. Give an example of a conditional statement in Arduino C.

7. What is the difference between Analog and Digital sensors?

8. Name two commonly used sensors and their applications.

9. What is the ESP8266 Node MCU used in IoT projects?

10. Name two open-source IoT cloud platforms for transmitting sensor data.

Part B (5 × 5 = 25)

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

11. (a) Explain the basic architecture of with a neat diagram.

Or

(b) What are the benefits and risks associated with industrial IoT?

12. (a) Convert the binary number 110101 to decimal.

Or

(b) Differentiate between microcontroller and multipurpose computers with respect to their use in IoT.

13. (a) Explain how to install and set up the Arduino IDE for programming.

Or

(b) What is the difference between global and local variable in Arduino C? Give examples.

14. (a) How can an LED to controlled using Arduino?

Or

(b) What are the key differences between a sensor and an actuator?

15. (a) What are the advantages of using open-source IoT cloud platform for sensor data transmission?

Or

(b) Write a brief explanation on how to use. Node MCU to send temperature sensor data to a cloud platform.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe in detail the security concerns in IoT.

17. Discuss the internal architecture of a microcontroller.

18. Create an Arduino program that reads a string from the serial monitor, checks its length using the string library and prints the reversed string back. Explain each step in detail.

19. Explain the process of interfacing an ultrasonic sensor with Arduino.

20. Explain in detail how to interface a temperature sensor with Node MCU and Arduino IDE to send the data to an open-source IoT cloud platform.

———————

S–3406

Sub. Code
23MCE4C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science

DISTRIBUTED OPERATING SYSTEM

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What does distributed architecture refers?

2. Mention the features to differentiate distributed and networking operating systems.

3. Draw the diagram of the two types of interprocess communication.

4. What does atomicity ensures?

5. Sketch out the tasks of server stub.

6. What is marshaling?

7. Recall 'thrashing' in a DSM system.

8. State starvation.

9. Infer mutable files.

10. Expand ACID.

Part B (5 × 5 = 25)

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

11. (a) Why are distributed computing system gaining popularity?

Or

(b) Justify that flexibility is the most important feature for open distributed systems.

12. (a) Explain synchronization with message buffering strategy.

Or

(b) Illustrate the CBCAST protocol for implementing casual ordering semantics.

13. (a) Explain transparency of RPC.

Or

(b) Explain RRR protocol with neat diagram.

14. (a) Give an account on hetrogeneous DSM.

Or

(b) Dissect centralized algorithm for clock synchronization.

15. (a) Describe quorum protocol.

Or

(b) Explain the advantages of state less service paradigm in crash recovery.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Draw and explain briefly various distributed compating system models.

17. Explain failure handling in IPC.

18. Elaborate server management in RPC based applications.

19. Examine NRNB strategy.

20. Summarize the desirable features of a good distributed file system.

———————

S–3407

Sub. Code
23MCE4C2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science

ARTIFICIAL NEURAL NETWORKS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the term neural network.
2. What is a memory based learning?
3. State the term of learning rate.
4. What is a linear least square filter?
5. Mention the uses of generalization in neural networks.
6. State the purpose of SOM.
7. What is simulated annealing?
8. Define the term of Gibbs sampling.
9. Define hyperplane in the context of SVM.
10. What is adaptive PCA?

Part B (5 × 5 = 25)

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

11. (a) Discuss in detail about the knowledge representation in neural networks.

Or

(b) Explain the concept of Boltzmann learning.

12. (a) Brief the concept of decision rules in classification.

Or

(b) Illustrate the importance of back propagation algorithm.

13. (a) Differentiate between training error and generalization error.

Or

(b) Describe the process of cross-validation.

14. (a) Enumerate the principle of simulated annealing with an example.

Or

(b) Discuss any two applications of Hopfield networks.

15. (a) Write a note on Hebbian based PCA.

Or

(b) Explain the difference between standard PCA and adaptive PCA.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss in detail about the learning without teacher.

17. Explain the concept of decision rules used in perceptrons.

18. Discuss the role of the Hessian matrix in optimization and how it affects convergence in MLP.

19. Discuss the concept of stability of equilibrium states in neuro dynamical models.

20. Describe the classes of PCA algorithms.

———————

S–3408

Sub. Code
23MCE4E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science

Elective — PARALLEL PROCESSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is a load balancing?
2. Write a short note on speed up in parallel processing.
3. State the uses of tightly coupled systems.
4. What is a shuffle exchange network?
5. Define the term control parallelism.
6. Brief the concept of temporal parallelism.
7. Define efficiency in parallel computing.
8. What is performance measure in parallel algorithm?
9. Mention the uses of multiport memory.
10. Write a short note on cache coherence.

Part B (5 × 5 = 25)

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

11. (a) Describe the importance of inter process communication in parallel system.

Or

(b) State any two major issues in parallel processing.

12. (a) Write a note on two dimensional mesh networks.

Or

(b) Discuss the scalability of hypercube networks.

13. (a) Describe the advantages and disadvantages of message passing.

Or

(b) Brief the importance of granularity in mapping tasks.

14. (a) Write a note on scalability issues in parallel algorithms.

Or

(b) Explain different design approaches used in parallel algorithm design.

15. (a) Differentiate between shared bus and cross bar inter connection.

Or

(b) Brief the concept of memory arbitration.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain different mechanisms of implementing parallel processing.

17. How interconnecting network affect parallel system performance? Explain in detail.

18. Explain the precedence graph for a set of dependent tasks.

19. Discuss in detail about the time and space complexities of parallel algorithms.

20. Explain the concept of cross bar interconnection networks in multiprocessors.

———————

S–3409

Sub. Code
23MCE4E2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science

Elective – CYBER SECURITY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What do you mean by Cyber Crime?

2. Give the use of Steganography.

3. Write a small note on Web browser.

4. Expland GPS and CDMA.

5. 1 TB = $2^{?}$ bytes and 2^{50} Bytes = ?

6. What is packet sniffer?

7. Mention few encryption programs.

8. Who exactly is the “First Responder”?

9. Mention the requirements of digital evidence.

10. What is pod slurping?

Part B (5 × 5 = 25)

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

11. (a) Explain shortly any ten kinds of cyber crime.

Or

(b) Write an account on computer forensics.

12. (a) Analyse that "Safe browsing".

Or

(b) Give the guidelines for using smart phones with safe.

13. (a) "Monitoring employees e-mails and internet activity" is legal. Justify.

Or

(b) Explain encrypted file system.

14. (a) Define and explain digital evidence.

Or

(b) Describe an incremental approach as a search strategy.

15. (a) Write about the difficulties when collecting evidence from any five non traditional devices.

Or

(b) Describe digital forensics and its phases.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain cyber attacks and also explain techniques to counter it.

17. Discuss in detail different kinds of best practices that should be followed when using wireless LAN.

18. Discuss IEEE 802.11 standard.

19. Examplify IP address.

20. Discuss the ways to prevent cyber crime target at you, your family and organization.

———————

S–3410

Sub. Code
23MCE4S1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Computer Science

ROBOTICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is a work envelope?

2. Define the term robots.

3. Mention the uses of transmission in robotics.

4. State the term of encoder.

5. What is a localization?

6. Mention the advantages of vision based localization.

7. What is object recognition?

8. Define cell decomposition method in path planning.

9. State the two uses of robots in mining.

10. What is the role of robots in space exploration?

Part B (5 × 5 = 25)

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

11. (a) Brief the concept of motion of a robotic aim.

Or

(b) Explain the importance of AI in robotics.

12. (a) Illustrate the model of a DC servomotor.

Or

(b) Explain the concept of frame transformation.

13. (a) Write a note on ultrasonic based localization.

Or

(b) Why localization is important in autonomous robots? Explain in detail.

14. (a) Discuss the concept of depth measurement in robotic vision systems.

Or

(b) Explain the importance of image data compression.

15. (a) Brief the concept of robotic applications in spray painting.

Or

(b) Discuss the concept of civillian applications of robots.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the history and evolution of robotics from early development to modern robots.

17. Discuss the kinematics of a differential wheel mobile robot.

18. Explain the working principle of IR based localization with neat diagram.

19. Explain the architecture of a robotic vision system.

20. Describe the major applications of industrial robots in manufacturing.

———————