D–1453	Sub. Code
	34111

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2025.

First Semester

Computer Science

DESIGN AND ANALYSIS OF ALGORITHMS

(CBCS 2018–19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What are the characteristics of good algorithm?

2. Why pseudo code is used in algorithm design?

3. What is the convex hull problem?

4. Differentiate between quicksort and mergesort.

5. Recall the main purpose of Floyd's algorithm.

6. Comment on dynamic programming.

7. Define optimization problem.

8. State the significance of sorting in combinatorial object generation.

9. What is mean by backtracking?

10. Define Hamiltonian cycle.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the fundamental steps in algorithmic problem solving.

Or

(b) Explain time complexity and its significance.

12. (a) Explain how binary search works with an example.

Or

(b) Explain the process of analyzing non-recursive algorithms.

13. (a) Explain Warshall's algorithm for computing the transitive closure of graph.

Or

(b) Describe the greedy method with an example.

14. (a) Discuss reduction to graph problems with an example.

Or

(b) Explain topological sorting with an example.

15. (a) Explain graph coloring and its significance.

Or

(b) Differentiate between NP-hard and NP-complete problems.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Compare and contrast different asymptotic notations with examples.

17. Compare brute force, selection sort and bubble sort in terms of efficiency.

18. Describe Prim's algorithm for constructing a minimum spanning tree with an example.

19. Describe breadth-first search (BFS) and compare it with DFS.

20. Explain the traveling salesman problem (TSP) with an example.

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	34112

DISTANCE EDUCATION

M.Sc.(Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

First Semester

APPLIED MATHEMATICS FOR COMPUTER SCIENCE

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. State atomic formulae.

2. Define the conjunction.

3. Define conjunctive normal form.

4. What are the rules of specifications?

5. Define connected graph.

6. Define spanning tree.

7. Define slack variables.

8. What is the role of the simplex method in solving LPP?

9. Can a transportation problem have multiple optimal solutions?

10. How do you handle an unbalanced assignment problem?

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Construct the truth table for $p \wedge \sim q$.

Or

(b) Show that the conjunction of two tautologies is also a tautology.

12. (a) Sum of two positive integers is greater than either of the integers.

Or

(b) Explain the types of quantification.

13. (a) Prove that every $(u - v)$ walk in a graph contains a $(u - v)$ path.

Or

(b) Interpret the adjacency matrix.

14. (a) Explain about Canonical form.

Or

(b) Use simplex method to solve the following LPP.

Maximize $z = 3x_1 + 2x_2$

Subject to constraints

$$x_1 + x_2 \leq 4$$
$$x_1 - x_2 \leq 2 \text{ and}$$
$$x_1, x_2 \geq 0.$$

15. (a) Obtain an initial basic feasible solution for the transportation problem by using North-West corner method.

	D	E	F	G	Available
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	

Or

(b) Find the optimum assignment schedule.

	E	F	G	H
A	1	4	6	3
B	9	7	10	9
C	4	5	11	7
D	8	7	8	3

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. (a) Show that $\sim(p \vee (\sim p \wedge q)$ and $\sim p \wedge \sim q$ are logically equivalent.

(b) Show that $p \leftrightarrow q$ logically implies $p \rightarrow q$.

17. Give an argument which will establish the validity of the following inference. 'All integers are rational numbers. Some integers are power of 2. Therefore, some rational numbers are power of 2'.

18. In a graph *G*, the prove the number of odd vertices is an even number.

19. Use two-phase simplex method to maximize $z = 5x_1 + 3x_2$

Subject to constraints $2x_1 + x_2 \leq 1,\ x_1 + 4x_2 \geq 6$ and $x_1, x_2 \geq 0$.

20. Obtain an optimum solution

	D1	D2	D3	D4	Supply
S1	3	7	6	4	5
S2	2	4	3	2	2
S3	4	3	8	5	3
Demand	3	3	2	2	

D–1455

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34113

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

First Semester

ADVANCED JAVA PROGRAMMING

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Mention the role of Connection class in JDBC.

2. Comment on meta data.

3. Name any two methods of the URL Connection class.

4. What is datagram in Java networking?

5. What is bound property in JavaBeans?

6. Comment on Bean Development Kit.

7. What is the role of getParameter() method?

8. Define cookie.

9. How is JApplet different from Applet?

10. What are panes in Swing?

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain the steps to establish a JDBC connection.

Or

(b) Classify the different types of JDBC drivers.

12. (a) Explain the difference between *executeQuery()* and *executeUpdate()*.

Or

(b) Differentiate between TCP and UDP in terms of reliability and speed.

13. (a) How do you create and use a JAR file in Java? Explain.

Or

(b) Explain the design pattern for JavaBean properties.

14. (a) Compare GenericServlet with HttpServlet.

Or

(b) Explain the advantages and disadvantages of session tracking using cookies.

15. (a) Explain the life cycle of JApplet in Java.

Or

(b) Compare AWT and Swing in Java.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Describe the JDBC architecture with a suitable diagram.

17. Explain the steps involved in RMI based client-server communication.

18. Interpret the concept of persistence in JavaBeans and how it is achieved.

19. Explain the life cycle of servlet with detailed diagram.

20. Explain how the Color class is used to set background and foreground colors.

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D–1456	Sub. Code
	34121

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Second Semester

COMPUTER SYSTEM ARCHITECTURE

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define computer architecture.

2. List any two quality principles in computer design.

3. What is data hazard?

4. State the limitation of ILP.

5. What is memory consistency?

6. Give examples of synchronization primitive.

7. What do you mean by memory protection?

8. Comment on memory hierarchy.

9. What is disk latency?

10. What do you mean by queuing delay

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain how dependability is measured in computer systems.

Or

(b) How is computer performance reported and summarized? Explain.

12. (a) Discuss dynamic scheduling and its importance in ILP.

Or

(b) Explain hardware-based speculation with suitable example.

13. (a) Describe thread-level parallelism and its significance in multiprocessor systems.

Or

(b) Discuss one cross-cutting issue in the design of parallel systems.

14. (a) How do virtual machines provide protection and isolation? Explain.

Or

(b) Describe the role of TLB in virtual memory systems.

15. (a) Explain how I/O performance is measured in computer systems.

Or

(b) Explain the function of Internet Archive Cluster.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Analyze the relationship between power, cost and performance in computer system design.

17. Explain the basic computer techniques used to expose ILP.

18. Describe distributed shared memory architectures in detail.

19. Discuss the techniques used to optimize cache performance.

20. Analyze the different types of disk storage technologies and their performance.

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D–1457	Sub. Code
	34122

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2025.

Second Semester

Computer Science

DISTRIBUTED OPERATING SYSTEM

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. List any two models of distributed systems.

2. Recall the main goal of distributed OS.

3. What do you mean by encoding in communication?

4. Comment on communication Protocol.

5. What is mutual exclusion?

6. What is heterogeneous DSM system?

7. What is file sharing semantics?

8. Define file caching.

9. Define digital signature.

10. Mention any two design principle of secure systems.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the concept and significance of internetworking.

Or

(b) Classify the types of computer networks with examples.

12. (a) Explain group communication with simple example.

Or

(b) State the key features of message passing.

13. (a) Explain the concept of clock synchronization with an example.

Or

(b) Explain deadlock in distributed systems.

14. (a) Classify the different file access modes in Distributed File System.

Or

(b) Discuss the advantages and challenges of file replication.

15. (a) Discuss how cryptography helps in securing communication.

Or

(b) Classify the major types of access control models.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Analyze the major issues in designing a distributed computing system.

17. Explain how failure handling is done in distributed message passing.

18. Explain the general architecture of Distributed Shared Memory system.

19. Analyze the role of fault tolerance in Distributed File System.

20. Describe various types of potential attacks on computer systems.

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	34123

DISTANCE EDUCATION

M.Sc. DEGREE EXAMINATION, DECEMBER 2025.

Second Semester

Computer Science

.NET PROGRAMMING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define namespace .NET.

2. What is garbage collection?

3. What is an MDI form?

4. Recall the purpose of InputBox() function.

5. Define Panel control.

6. Define RadioButton.

7. Mention the purpose of the Global.asax file.

8. What does the Page class represent in ASP.NET?

9. State the use of System.Data namespace.

10. Define DataRow.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the role of CLR in .NET framework.

Or

(b) Differentiate between method overloading and method overriding.

12. (a) What are the various types of operators in VB.NET? Explain with examples.

Or

(b) Compare Sub Procedures and Functions in VB.NET.

13. (a) Classify different types of errors with suitable examples.

Or

(b) What is an exception? How it is different from an error?

14. (a) Describe any two file types commonly used in ASP.NET and their purposes.

Or

(b) What are list controls? Give examples with usage.

15. (a) Describe the steps to bind data to GridView control in ASP.NET.

Or

(b) Explain how SQL query can be used to populate a DataList control.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Compare abstraction and encapsulation with proper code-based illustrations.

17. Explain the conditional statements in VB.NET with an example.

18. Illustrate the purpose of TreeView and ListView controls and their differences.

19. Compare and explain the functionalities of HttpRequest and HttpResponse with examples.

20. Compare and contrast various data binding controls.

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	34131

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Third Semester

CRYPTOGRAPHY AND NETWORK SECURITY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define security attacks.

2. What is plaintext and ciphertext?

3. What is the key size of DES?

4. Recall the major weaknesses of DES.

5. Compare public-key cryptosystem with symmetric-key cryptosystem.

6. Recall the main purpose of MACs in cryptography.

7. Name two digital signature schemes.

8. What is message authentication?

9. Why is email security important?

10. Mention the need of Pretty Good Privacy.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Discuss various security services and their importance.

Or

(b) Explain the significance of cryptography in network security.

12. (a) Describe the key design principles of secure block cipher.

Or

(b) Describe the structure of the Data Encryption Standard (DES).

13. (a) Describe how elliptic curve cryptography works with an example.

Or

(b) Compare and contrast Diffie-Hellman and ElGamal cryptosystems.

14. (a) Explain the requirements for message authentication.

Or

(b) Discuss the security aspects of MACs and their importance.

15. (a) Compare SSL and TLS in terms of security and performance.

Or

(b) Explain the overview of 1P security (IPSec) and its components.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the symmetric cipher model in detail with diagram.

17. Compare DES and AES in terms of security, efficiency and implementation.

18. Describe the working of the RSA algorithm with an example.

19. Explain digital signatures and its role in ensuring security.

20. Describe the working of Pretty Good Privacy (PGP) and how it secures email communication.

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	34132

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Third Semester

CLOUD COMPUTING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define cloud service development.

2. Name two tools used in cloud service development.

3. List the benefit of centralizing email communications

4. List two ways corporations benefit from cloud computing.

5. Name two online file-sharing platforms.

6. What is database collaboration?

7. What is Microsoft Live?

8. List the different types of cloud implementations.

9. What is server virtualization?

10. What is Logical Partitioning (LPAR) in cloud computing?

PART B — (5 × 5 = 25 marks)

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

11. (a) List and explain five benefits of cloud computing.

Or

(b) Compare with contrast SaaS and PaaS.

12. (a) How does cloud computing assist in managing household budgets efficiently?

Or

(b) Compare different cloud-based tools for team collaboration.

13. (a) Discuss the advantages of using online scheduling applications.

Or

(b) Explain how cloud collaboration enhances event management.

14. (a) Describe the major features of Amazon Web Services.

Or

(b) Explain how vCloud helps in cloud deployment.

15. (a) Illustrate the role of VIO Server in virtualized environment.

Or

(b) Explain the role of Storage Area Networks (SANs) in cloud environments.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss the working of cloud computing with an example.

17. Discuss the various cloud-based tools used for collaborating on group projects and events.

18. Describe the different methods of storing and sharing files in cloud securely.

19. Explain Google App Engine and its significance in cloud-based application development.

20. Explain hypervisors and their types in detail.

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	34133

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Third Semester

WEB TECHNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What is the function of <img> tag?

2. What does HTML stands for?

3. Define JavaScript.

4. Recall the purpose of cookies in JavaScript.

5. Comment on AJAX.

6. Define SAX in the context of XML processing.

7. Mention any two advantages of using servlets over traditional CGI scripts.

8. Write a short note on servlet reloading.

9. What does MVC stands for?

10. Name any two tool or IDE to be used for developing JSP applications.

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain the differences between HTML and XML.

Or

(b) Write a brief note on text formatting in HTML using various tags? Give an example.

12. (a) Describe the various string manipulation methods in JavaScript.

Or

(b) What are cookies in JavaScript? How do you create and retrieve them?

13. (a) Explain how XPath is used to navigate XML documents. Provide an example.

Or

(b) How XSL and XSLT used to manipulate and transform XML data? Explain.

14. (a) Demonstrate the basic structure of an HTTP Servlet and how it handles HTTP requests and responses.

Or

(b) Discuss about the page generation work in Java Servlets. Explain the process briefly.

15. (a) How does a JSP page differ from a servlet? Discuss the process of converting a JSP page into a servlet.

Or

(b) Describe the anatomy of a typical JSP page. Explain its components in detail.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss about table creation and formatting in HTML. Give an example.

17. Explain the concept of DHTML. How does it differ from static HTML?

18. Describe the evolution of DOM. What are the new features introduced at each level?

19. Compare and contrast client-side and server-side caching in terms of performance, complexity, and use cases.

20. Explain in detail about the Model-View-Controller (MVC) design pattern and its application.

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D–1462

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34141

DISTANCE EDUCATION

M.Sc (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Fourth Semester

DATA MINING AND WARE HOUSING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Comment on data warehouse.

2. Define extraction tools in data warehousing.

3. Define similarity measure in data mining.

4. Mention the current trend in data mining.

5. What is the FP-Tree Growth Algorithm?

6. Define confidence and Support.

7. What is hierarchical clustering?

8. Mention the two advantages of DBSCAN clustering.

9. What is web content mining?

10. Define knowledge mining.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Describe how transformation tools are used in data processing.

Or

(b) How is data warehousing applied in genomics research? Explain.

12. (a) Discuss the importance of data reduction and enrichment.

Or

(b) How does data visualization help in data exploration?.

13. (a) Describe how decision tree classifier works with an example.

Or

(b) Explain the key principles of Bayesian classification.

14. (a) Compare the K-Means and K-Medoid clustering algorithms.

Or

(b) How do CLARA and CLARANS improve clustering efficiency? Explain.

15. (a) Describe the visual data mining and their application.

Or

(b) Describe the role of text mining in data analysis.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the various OLAP operations with examples.

17. Explain the process of data selection, cleaning, integration and transformation in data mining.

18. Describe the working of the Apriori algorithm with an example.

19. Interpret the structure and working of neural networks with an example.

20. Compare the features of Weka, RapidMiner and MATLAB in data mining.

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	34142

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Fourth Semester

MOBILE APPLICATION DEVELOPMENT

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What is mobile ecosystem?

2. Recall the purpose of mobile platform.

3. State the primary function of a utility app.

4. What is an enterprise application?

5. Mention the purpose of wireframe.

6. What is the significance of responsive design?

7. What does J2ME stand for?

8. Name the two types of profiles in J2ME.

9. Define Android AVD.

10. Name the mobile OS developed by BlackBerry.

PART B — (5 × 5 = 25 marks)

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

11. (a) Compare iOS and Android operating systems.

Or

(b) Explain the key differences between 4G and 5G networks.

12. (a) Explain the significance of an application store in mobile ecosystem.

Or

(b) Compare and contrast native apps and web apps.

13. (a) Write the key considerations in mobile architecture.

Or

(b) Compare and contrast adaptive and responsive design.

14. (a) Explain in detail about 'Hello world' application using wireless toolkit.

Or

(b) Describe the J2ME run-time environment.

15. (a) Discuss Microsoft Windows Phone.

Or

(b) State the strengths and weaknesses of the Nokia Symbian operating system.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss the role of mobile application frameworks in app development.

17. Discuss the challenges in developing and maintaining native applications for gaming and LBS apps.

18. List and explain elements of mobile design.

19. Explain the architecture of J2ME.

20. Discuss Google Android Application Development in detail.

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D–1464

Sub. Code
34143

DISTANCE EDUCATION

M.Sc. (Computer Science) DEGREE EXAMINATION, DECEMBER 2025.

Fourth Semester

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define Artificial Intelligence.

2. What is problem formulation in AI?

3. What are inference rules in propositional logic?

4. What are Bayesian networks?

5. State the main components of an expert system.

6. What is knowledge acquisition in expert systems?

7. Define block world problem.

8. What is path selection in AI?

9. Recall the purpose of encoding in image storage.

10. What is feature extraction in computer vision?

PART B — (5 × 5 = 25 marks)

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

11. (a) How does forward reasoning differ from backward reasoning?

Or

(b) Explain the significance of optimization problems in AI.

12. (a) Describe the knowledge engineering process in AI.

Or

(b) State the importance of learning in AI systems.

13. (a) Explain the advantages and limitations of expert systems.

Or

(b) Compare rule-based and non-rule-based expert systems.

14. (a) Explain state space search with an example.

Or

(b) How is means-end analysis used in solving robotic problems?

15. (a) Explain the functions of vision system in AI.

Or

(b) Describe the role of lighting in a vision system.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss the major application areas of AI with examples.

17. Compare relational knowledge and procedural knowledge with suitable examples.

18. Explain the architecture of a rule-based expert system.

19. Explain how robot problem can be formulated as a production system.

20. Describe different methods of image data reduction and their importance.

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