D–8462

Sub. Code
34111

DISTANCE EDUCATION

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

First Semester

DESIGN AND ANALYSIS OF ALGORITHMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define the term algorithm.

2. State the characteristics of good algorithm.

3. Define the closest-pair problem.

4. What is recursive algorithm?

5. What is an optimal binary search tree?

6. State the significance of Dijkstra's algorithm.

7. What is topological sorting?

8. Define the term heap.

9. Define graph coloring.

10. Comment on assignment problem.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain space complexity and its significance.

Or

(b) Explain the importance of analyzing algorithm efficiency.

12. (a) Describe brute force approach with an example.

Or

(b) Explain selection sort with its time complexity analysis.

13. (a) Discuss the computation of binomial coefficients using dynamic programming.

Or

(b) Explain Kruskal's algorithm wih an example.

14. (a) Explain the working of depth-first search (DFS) with an example.

Or

(b) Describe heap and heap sort with an example.

15. (a) Describe the sum of subsets problem with an example.

Or

(b) Explain the Hamiltonian cycle problem with an example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Compare and contrast Big-O, Omega and Theta notations with examples.

17. Discuss about quick sort algorithm with an example.

18. Explain the knapsack problem using dynamic programming with an example.

19. Discuss different optimization problems and their significance in algorithm design.

20. Explain the 8-queen problem and how it can be solved using backtracking.

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D–8463

Sub. Code
34112

DISTANCE EDUCATION

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

First Semester

APPLIED MATHEMATICS FOR COMPUTER SCIENCE

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Find the conjunction of the propositions p and q where p is the proposition 'Today is Sunday' and q is the proposition 'It is raining today'.

2. Define Tautology.

3. Define Disjunctive normal form.

4. State the rules of generalisation.

5. Define regular graph.

6. Define adjacency matrix.

7. Define feasible solution and optimal solution in LPP.

8. What is meant by the unbounded solution in LPP?

9. Name two methods used to find an IBFS in TP.

10. Define degeneracy in an assignment problem.

PART B — ($5 \times 5 = 25$ marks)

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

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

Or

(b) Verify if the proposition $(p \wedge q) \vee \sim (p \vee q)$ is a contradiction.

12. (a) State the properties of PCNF and PDNF.

Or

(b) Write the predicate 'x is the father of the mother of y'.

13. (a) Define : (i) Complement of a graph (ii) Degree of a vertex.

Or

(b) Prove that every two vertices in a tree are joined by a unique path.

14. (a) Solve the following LPP by graphical method.

Maximize $z = 5x_1 + 3x_2$

Subject to constraints

$$x_1 + x_2 \leq 6$$
$$2x_1 + 3x_2 \geq 6 \text{ and } x_1, x_2 \geq 0$$

Or

(b) Explain about slack and surplus variables.

15. (a) Obtain an initial basic feasible solution for the transportation problem by Least cost method.

	D_1	D_2	D_3	D_4	Available
O_1	1	2	3	4	6
O_2	4	3	2	0	8
O_2	0	2	2	1	10
Demand	4	6	8	6	

Or

(b) Find the optimum assignment schedule.

	1	2	3
I	9	26	15
II	13	27	6
III	35	20	15
IV	18	30	20

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Construct the truth tables for $(p \wedge q) \vee (q \wedge r) \vee (r \wedge p)$.

17. Explain the open statements with suitable example.

18. Prove that if B is a circuit matrix of a connected graph G with e edges and n vertices, rank of $B = e - n + 1$.

19. Use simplex method to solve the following LPP.

Maximize $z = 4x_1 + 10x_2$

Subject to constraints

$2x_1 + x_2 \leq 50$

$2x_1 + 5x_2 \leq 100$

$2x_1 + 3x_2 \leq 90$ *and* $x_1, x_2 \geq 0$.

20. Obtain an initial basic feasible solution for the transportation problem by VAM.

	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	

D–8464

Sub. Code
34113

DISTANCE EDUCATION

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

First Semester

ADVANCED JAVA PROGRAMMING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Name any two interfaces in the java.sql package.

2. Mention the role of DriverManager class in JDBC.

3. Recall the purpose of InetAddress class in Java.

4. How does URL differ from URI in Java?

5. What are constrained properties in JavaBeans?

6. Recall the purpose of customizers in JavaBeans.

7. What is init( ) method in servlet?

8. State the purpose of GenericServlet class.

9. Which method is used to add a button in Swing?

10. What is the purpose of font class in Java?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Write a short note on connection class in JDBC.

Or

(b) Differentiate between JDBC bridge driver and thin driver.

12. (a) Describe the structure of URL and explain its key components.

Or

(b) Examine the role stub and skeleton in Java RMI.

13. (a) Illustrate the persistence mechanisms in JavaBeans.

Or

(b) Explain the purpose and features of the Bean Development Kit.

14. (a) Explain the life cycle of Servlet with its methods.

Or

(b) How can servlet read initialization parameters? Provide an example.

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

Or

(b) How do you create and apply custom fonts in Java?

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the process of connecting a Java application to a database using JDBC.

17. Explain the working of TCP/IP sockets with a Java program for client-server communication.

18. Develop a step-by-step process to creating and using a JAR file for JavaBeans.

19. Compare and contrast cookies and session tracking in servlets.

20. Write a Java program demonstrating JApplet with buttons and combo boxes.

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D–8465

Sub. Code
34121

DISTANCE EDUCATION

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

Second Semester

COMPUTER SYSTEM ARCHITECTURE

CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Comment on integrated circuit logic technology.

2. What is mean by service interruption?

3. Predict the ILP challenges.

4. State the compiler techniques for exposing ILP.

5. Define synchronization.

6. What is mean by thread level parallelism?

7. Define memory access time.

8. List the benefits of using VMs.

9. What metrics are used to measure I/O performance in storage systems?

10. What is queuing theory?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) List out the different quantitative principles of computer design.

Or

(b) Explain about manufacturing cost versus operation cost.

12. (a) Compare instruction level parallelism and machine parallelism.

Or

(b) Explain in detail about static branch prediction.

13. (a) Discuss about the distributed shared memory.

Or

(b) Analyze the role of cache coherence in multiprocessor.

14. (a) Demonstrate the protection in virtual memory.

Or

(b) Classify cache optimization.

15. (a) Discuss in detail the different levels of RAID.

Or

(b) State the common types of faults and failures that occur in disk storage system.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain about power and energy in integrated circuits.

17. Explain the techniques to overcome data hazards with dynamic scheduling.

18. Describe the symmetric shared memory architecture.

19. Express in detail about the optimizations of cache performance.

20. Discuss about reliability, availability and dependability for storage devices.

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D–8466	Sub. Code
	34122

DISTANCE EDUCATION

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

Second Semester

DISTRIBUTED OPERATING SYSTEM

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. State the types of interaction model.

2. Mention the main components of a computer network.

3. What are the types of group communication systems?

4. What do you mean by group membership?

5. Define the term granularity.

6. What is the purpose of an election algorithm in distributed systems?

7. Why directory structure is needed for files?

8. Comment on file replication.

9. List the two objectives of computer security.

10. Define cryptography.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss the evolution of distributed OS.

Or

(b) Classify the different types of computer network.

12. (a) Describe the main features of message passing.

Or

(b) Why is synchronization important in message passing? Discuss.

13. (a) What do you understand by replacement strategy? Explain.

Or

(b) Explain the heterogeneous distributed shared memory.

14. (a) Discuss the desirable features of DFS.

Or

(b) Classify the various file accessing models in distributed systems.

15. (a) Explain the concept of authentication in computer security.

Or

(b) Classify the different types of security attacks.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain about communication between two machines using OSI model.

17. Illustrate the concept of buffering and its types.

18. Discuss the design and implementation issues of DSM.

19. Interpret the strategies used to achieve fault tolerance in distributed file systems.

20. Explain the concept of digital signatures and how they are used in computer security.

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D–8467	Sub. Code
	34123

DISTANCE EDUCATION

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

Second Semester

.NET PROGRAMMING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is a namespace in .NET?

2. Comment on overloading.

3. Mention the purpose of InputBox.

4. How do you use the Rich TextBox control?

5. How do you create custom exceptions in .NET?

6. What are picker controls?

7. What is Server Utility in ASP.NET?

8. Define AJAX.

9. What are data binding controls in ASP.NET?

10. What are the different file types used in an ASP.NET applications?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Interpret the concept of polymorphism.

Or

(b) How does an object relate to a class in .NET? Discuss.

12. (a) How do you declare and initialize an array in VB.NET? Discuss.

Or

(b) How do you create and manage child forms in an MDI application? Explain.

13. (a) Explain about tree view control with example.

Or

(b) How do radio buttons differ from check boxes? Explain with example.

14. (a) Explain HttpResponse in ASP.NET and how it is used to send responses to the client.

Or

(b) How do you import namespaces in an ASP.NET page? Provide an example.

15. (a) Differentiate between ADO.NET dataset and an ADO record set.

Or

(b) Explain the concept of data objects in ASP.NET.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Classify the different types of inheritance.

17. How does a *for loop* differ from a *while loop*? Analyze with example.

18. How do you create a Windows application using Windows controls? Explain.

19. Describe the different data controls available in ASP.NET.

20. Explain the Data Grid Control in ASP.NET and its use in displaying tabular data.

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D–8468	Sub. Code
	34131

DISTANCE EDUCATION

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

Third Semester

CRYPTOGRAPHY AND NETWORK SECURITY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Comment on cryptography.

2. What is symmetric cipher model?

3. What is differential cryptanalysis?

4. Name any two AES transformation functions.

5. What is public-key cryptosystem?

6. Mention the role of prime numbers in RSA encryption.

7. Why is ECC considered more efficient than RSA?

8. Name two digital signature schemes.

9. What is the main considerations for web security.

10. Mention the use of PGP in email security.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Describe different types of security attacks with examples.

Or

(b) Explain substitution techniques with an example.

12. (a) Explain the basic working principle of block ciphers.

Or

(b) Describe the AES structure with its key components.

13. (a) Describe the ElGamal cryptosystem and its components.

Or

(b) Analyze the strengths and weaknesses of the RSA cryptosystem.

14. (a) Describe the role of message authentication functions in securing communication.

Or

(b) Discuss the Digital Signature Standard (DSS) in detail.

15. (a) Describe the working of the Secure Socket Layer (SSL) and its importance.

Or

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

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the model for network security and explain how it ensures data protection.

17. Describe the Data Encryption Standard (DES) algorithm in detail.

18. Explain the Diffie-Hellman key exchange algorithm with a step-by-step process.

19. Describe the ElGamal digital signature scheme with an example and analyze its security.

20. Explain the importance of IPSec policies and how they control secure communications.

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D–8469	Sub. Code
	34132

DISTANCE EDUCATION

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

Third Semester

CLOUD COMPUTING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is cloud computing?

2. State the primary goal of cloud computing.

3. Define collaboration in cloud computing.

4. What is the role of cloud computing in scheduling?

5. Name two popular online task management tools.

6. Recall the purpose of collaboration in event management.

7. Name two services offered by Amazon Web Services.

8. What is the purpose of Google App Engine?

9. What is virtualization in cloud computing?

10. Define hypervisor in virtualization.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the history of cloud computing briefly.

Or

(b) Compare private, public and hybrid cloud models.

12. (a) Explain how cloud computing helps in centralizing email communications.

Or

(b) How could-based scheduling tools help in time management? Explain.

13. (a) Explain the features of online calendar applications.

Or

(b) Compare online project management tools and their benefits.

14. (a) Describe the different classifications of cloud implementation.

Or

(b) Explain how VMware supports cloud infrastructure.

15. (a) List and explain the benefits of server virtualization.

Or

(b) State the features and benefits of virtualized data centre.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the pros and cons of cloud service development.

17. Discuss how cloud-based to-do lists improve productivity and teamwork.

18. Discuss the advantages of cloud-based word processing and its impact on businesses.

19. Compare IaaS, PaaS and SaaS with real-world applications.

20. Explain the concept of virtualization and its importance in cloud computing.

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D–8470

Sub. Code
34133

DISTANCE EDUCATION

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

Third Semester

WEB TECHNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define WWW.

2. Name the two types of lists in HTML.

3. What is dynamic HTML?

4. List out any two mathematical functions available in JavaScript.

5. What are the different levels of DOM?

6. Mention the purpose of XML namespaces.

7. Recall the functions of servlets.

8. Comment on client-side caching in web development.

9. Define the anatomy of a JSP page.

10. What is Apache Tomcat?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Describe ordered and unordered lists with an example.

Or

(b) What are CSS styles sheets? Explain how they improve web design.

12. (a) How do you declare and use variables in JavaScript? Provide examples.

Or

(b) Discuss about the implementation of a rollover button using JavaScript.

13. (a) Explain the concept of Ajax in web development.

Or

(b) Write a brief note on the role of XML for representing web data.

14. (a) Describe the basic architecture of a Java Servlet-based web application.

Or

(b) What are the benefits and drawbacks of using client-side caching in web applications?

15. (a) Illustrate the Model-View-Controller (MVC) design pattern in detail.

Or

(b) Explain how to create, install and run a simple JSP page on a Tomcat server.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Compare and contrast HTML, XML and WWW.

17. Demonstrate array and its methods in JavaScript with an example.

18. Discuss the integration of JavaScript with XML in web development.

19. Elaborate on the life cycle of Java Servlet.

20. Explain about HTTP request/response model and its signification in web development.

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D–8471	Sub. Code
	34141

DISTANCE EDUCATION

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

Fourth Semester

DATA MINING AND WAREHOUSING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is warehouse schema?

2. Mention the purpose of transformation tools in data warehousing.

3. Mention the need of data cleaning.

4. What is data visualization?

5. What is the main purpose of the apriori algorithm?

6. Comment on back propagation?

7. What is clustering in data mining?

8. What is the role of neural networks in machine learning?

9. Define web structure mining.

10. Mention the two advantages of using RapidMiner.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the importance of extraction tools in data warehousing.

Or

(b) Discuss the use of data warehousing in the tourism industry.

12. (a) Compare different types of data used in data mining.

Or

(b) Discuss different measures of similarity and dissimilarity in data mining.

13. (a) Explain the basic concepts of association rule mining.

Or

(b) Compare decision tree classification and Bayesian classification.

14. (a) Compare supervised and unsupervised learning.

Or

(b) How do genetic algorithms work in optimization problems? Explain.

15. (a) Explain how Weka is used for data mining tasks.

Or

(b) Explain the role of MATLAB in data mining and statistical analysis.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Draw and explain the data warehouse architecture.

17. Explain the different techniques used in data mining.

18. Explain the steps involved in the FP-Tree growth algorithm.

19. Explain CLARA and BIRCH clustering algorithms and compare their efficiency.

20. Discuss the importance of temporal data mining and its applications.

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D–8472	Sub. Code
	34142

DISTANCE EDUCATION

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

Fourth Semester

MOBILE APPLICATION DEVELOPMENT

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Name two mobile operating systems.

2. Give an example of cloud-based mobile service.

3. What is mobile web widget?

4. What does SMS stand for?

5. Define click streams.

6. Mention two key elements of mobile design.

7. What is CLDC in J2ME?

8. State the features of J2ME Wireless Toolkit.

9. What is the function of an android emulator?

10. What is the purpose of the Eclipse IDE in Android development?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the components of the mobile ecosystem.

Or

(b) Describe the role of security in mobile operating systems.

12. (a) Explain the role of SMS in mobile communication.

Or

(b) Discuss the impact of gaming apps on the mobile industry.

13. (a) Explain the role of sitemaps in mobile application design.

Or

(b) Elaborate note on mobile design tools.

14. (a) Differentiate between J2ME and J2SE.

Or

(b) Explain the MIDlet lifecycle in detail.

15. (a) Elaborate the use of software development framework.

Or

(b) Discuss the evolution of the Android development framework.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the importance of mobile applications in daily life.

17. Compare and contrast mobile websites and mobile applications in terms of usability, accessibility and performance.

18. Explain about mobile information architecture.

19. Interpret the Layers of the J2ME architecture.

20. Explain the role of the Android SDK and the importance of the emulator in testing android applications.

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D–8473

Sub. Code
34143

DISTANCE EDUCATION

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

Fourth Semester

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define problem-solving agents.

2. What is the difference between graphs and trees in AI?

3. Define relational knowledge.

4. List any two inference methods used in AI.

5. Mention two characteristics of expert systems.

6. Define rule-based expert system.

7. What is an AND-OR graph?

8. Define robot learning.

9. Name two functions of vision system.

10. What is quantization in image processing?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the concept of AI and its different approaches.

Or

(b) Analyze the role of Genetic Algorithm in AI.

12. (a) Explain the working of Bayesian networks with an example.

Or

(b) Discuss pattern recognition and its applications in AI.

13. (a) How do expert systems perform reasoning? Explain with examples.

Or

(b) State the various applications of expert systems in different fields.

14. (a) Explain graph planning in robotics with suitable example.

Or

(b) Explain obstacle avoidance in robot navigation.

15. (a) Classify the different types of imaging devices used in vision systems.

Or

(b) Explain how feature extraction is used in object recognition.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain how problem-solving performance is measured in AI.

17. Discuss different inference rules and their role in AI problem-solving.

18. Describe the role of domain knowledge in expert systems.

19. Explain the monkey and banana problem using state space search.

20. Explain various segmentation techniques used in image processing.

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