

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

MCA, Semester- 1st

DISCRETE STRUCTURES AND OPTIMIZATION

Subject Code: 25C2CAP-101

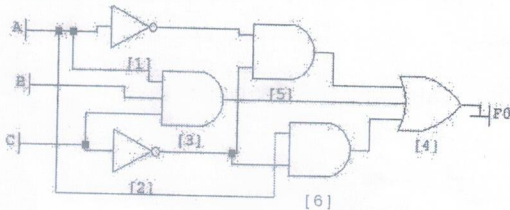
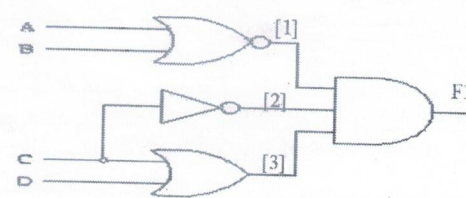
M.Code:

Date of Examination: 15-12-2025

Time: 3 Hrs.**Max. Marks: 70****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE question of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define Inclusion-Exclusion Principle.	CO1	L1
b.	Differentiate proper subset and improper subset.	CO1	L2
c.	State any four elementary law of Boolean algebra.	CO2	L1
d.	Interpret the following sets in roaster form. (i) $C = \left\{x: \frac{x-2}{x-3} = 3, x \in R\right\}$ (ii) $B = \{x \in Z: x < 4\}$	CO2	L2
e.	State fundamental theorem of group homomorphism.	CO2	L1
f.	Show there exist a real number n such that $P(9,5)+5P(9,4)=P(10,n)$ where $P(.,.)$ is permutation.	CO3	L2
g.	Define permutation and combination.	CO3	L1
h.	Explain whether for the following graph satisfies the Euler's formula or not?	CO4	L2
i.	Define homomorphic graph and draw two homomorphic graphs.	CO4	L1
j.	Show that the set $G = \{1, \omega, \omega^2\}$ of cube root of unity forms a group under multiplication.	CO2	L2
SECTION-B			
2.	Identify the truthiness of De Morgan's Law for $(A \cup B)^c$ and $(A \cap B)^c$ sets.	CO1	L3
3.	Examine the following statement: The subset S of all matrices of the form $\begin{bmatrix} x & 0 \\ 0 & y \end{bmatrix}$ with x and y integers forms a subring of 2×2 matrices with integer elements and further the S is neither a right ideal nor left ideal.	CO2	L4

4.	In a town of 10,000 families it was found that 40% of families buy newspaper A. 20% buy newspaper B and 10% buy newspaper C. 5% families buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the newspaper, find the number of families which buy (i) A only (ii) B only (iii) none of A, B and C.	CO1	L5																									
5.	Evaluate the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these (i) Four cards of the same suit (ii) Four cards belong to different suits (iii) Are face cards (iv) Two are red cards and two are black cards (v) Cards are of the same colour	CO3	L5																									
SECTION-C																												
6.	Apply the concept of permutation to find the number of different signals that can be made by arranging at least three flags in order on a vertical pole if 6 different flags are available.	CO3	L3																									
7.	Analyse the following algebraic expressions to construct the tree (i) $3 - (x + (6 \times (4 + (2 - 3))))$ (ii) $(2 - (3 \times x)) + ((x - 3) - (2 + x))$	CO4	L4																									
8.	A salesman wants to visit cities E, F, G and H. He does not want to visit any city twice before completing the tour of all the cities and wishes to return to his home city cost of going from one city to another in rupees is given. Find the least cost route. <table><tr><td></td><td>E</td><td>F</td><td>G</td><td>H</td></tr><tr><td>E</td><td>0</td><td>3</td><td>8</td><td>5</td></tr><tr><td>F</td><td>4</td><td>0</td><td>14</td><td>3</td></tr><tr><td>G</td><td>4</td><td>5</td><td>0</td><td>2</td></tr><tr><td>H</td><td>7</td><td>8</td><td>13</td><td>0</td></tr></table>		E	F	G	H	E	0	3	8	5	F	4	0	14	3	G	4	5	0	2	H	7	8	13	0	CO4	L5
	E	F	G	H																								
E	0	3	8	5																								
F	4	0	14	3																								
G	4	5	0	2																								
H	7	8	13	0																								
9.	Construct the Boolean expression of output with systematic progress at each step. (i)  (ii) 	CO2	L3																									

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 09

MCA, Semester-1st
PROGRAMMING IN PYTHON
Subject Code: 25C2CAP-102

M.Code:

Date of Examination: 19-12-2025

Max. Marks: 70

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATES:

- INSTRUCTIONS TO CANDIDATES:**
1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
 2. SECTION B & C have **FOUR** questions each.
 3. Attempt any **FIVE** question of SECTION B & C carrying **TEN** marks each.
 4. Select at least **TWO** questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:	CO1	L1
a.	What is a Python interpreter?	CO1	L2
b.	Contrast between arithmetic and comparison operators with examples in python.	CO2	L1
c.	List any two differences between static typing and dynamic typing with reference to Python.	CO2	L2
d.	Summarize how we can check the type of a variable in Python?	CO3	L1
e.	Name the three types of control structures in Python.	CO3	L2
f.	Explain how an if-else statement works in Python?	CO4	L1
g.	Why we use "def" keyword in python? Explain with suitable example.	CO4	L2
h.	Show how to create and use a custom exception class?	CO5	L1
i.	Define the " __init__() " function in Python.	CO5	L2
j.	Illustrate how to check if a file exists using Python.		
SECTION-B			
2.	Apply arithmetic operators to perform addition, subtraction, multiplication and division in python.	CO1	L3
3.	Compare Python, C, C++ and Java in terms of syntax, memory management and library support.	CO2	L4
4.	Assess the usage of nested loops and Conditional statements in python.	CO3	L5
5.	Evaluate the advantages and disadvantages of Python's dynamic typing compared to statically typed languages.	CO1	L5
SECTION-C			
6.	Develop a Python program that imports a custom module and calls one of its functions.	CO4	L3
7.	Examine the concept of exception handing in python with suitable examples.	CO5	L4
8.	Judge how we can use Default, Keyword (named), Positional and Arbitrary arguments In python functions.	CO4	L5
9.	Identify how polymorphism achieve in python ,also explain its types with suitable examples.	CO5	L3

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Total No. of Pages: 01

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MCA, Semester- 1st
ADVANCED DATA STRUCTURES

Subject Code: 25C2CAP-103

M.Code:

Date of Examination: 17-12-2025

Time: 3 Hrs.**Max. Marks: 70****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE question of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	How to Differentiate between best case and worst case analysis.	CO1	L1
b.	Classify the Heap Sort.	CO1	L2
c.	What is an algorithm?	CO2	L1
d.	Demonstrate the Hash Table.	CO2	L2
e.	Define the types of rotations in AVL Trees.	CO3	L1
f.	Explain the collision in Hashing.	CO3	L2
g.	What is a Binomial Heap?	CO4	L1
h.	Outline the Minimum Spanning Tree.	CO4	L2
i.	What is the difference between directed and undirected graphs?	CO5	L1
j.	Explain the string in data structures.	CO5	L2
SECTION-B			
2.	Identify the linear and non-linear data structures with appropriate diagrams and explain their key characteristics.	CO2	L3
3.	Classify the limitations of Direct Address Tables and how Hash Tables overcome them.	CO1	L4
4.	Examine and analyse the algorithm for quick sort and apply the same on following sequence : 8 5 7 3 2 1 6 4 9	CO2	L5
5.	Explain the Splay Tree and splaying operation and rotations with examples.	CO3	L5
SECTION-C			
6.	Compare Binomial Heaps and Fibonacci Heaps in detail with example.	CO4	L4
7.	Classify a graph in the context of data structures and explain the key characteristics that differentiate various terminology of graphs.	CO5	L5
8.	Analyse the minimum spanning tree. Explain the Kruskal's algorithm used to find out the minimum spanning tree of a graph with the help of a suitable example.	CO4	L4
9.	Compare the KMP with Brute Force and Rabin–Karp algorithms in terms of time complexity and practical usage.	CO5	L5

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MCA, Semester- 1st

TECHNICAL COMMUNICATION

Subject Code: 25C2CAP-105

M.Code:

Date of Examination: 23-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE question of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List the main elements involved in effective communication.	CO1	L1
b.	Interpret the process of email etiquette in brief.	CO1	L2
c.	Define technical proposals briefly.	CO2	L1
d.	Illustrate the importance of letters in professional communication.	CO2	L2
e.	Recall notice and its uses in an organization.	CO3	L1
f.	Explain the importance of tone in verbal communication.	CO3	L2
g.	Define resume briefly.	CO4	L1
h.	Explain the importance of feedback in communication process.	CO4	L2
i.	Recall the differences between intrapersonal and interpersonal communication.	CO5	L1
j.	Illustrate the importance of technical communication in professional journey.	CO5	L2
SECTION-B			
2.	Appraise a flowchart to explain Shannon-Weaver's model.	CO1	L5
3.	Analyze how communication impacts customer satisfaction.	CO3	L4
4.	Identify the uses of 7C's of communication in effective communication. Give appropriate example for each of them.	CO4	L3
5.	Criticize various types of barriers to communication and infer how to handle them.	CO5	L5
SECTION-C			
6.	Explain the steps of report writing to draft a technical report.	CO4	L5
7.	Compare between APA and MLA styles of references. Give appropriate example, and also infer the importance of referencing in research work.	CO5	L4

8	Classify the steps of formal letter writing with an example.	CO2	L4
9.	Identify effective non-verbal communication during an interview.	CO3	L3

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MCA, Semester- 1st
TECHNICAL COMMUNICATION

Subject Code: PGCA1905

M. Code: 79039

Date of Examination: 6-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE questions of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Identify any two benefits of intra-communication.	CO2	L1
b.	Explain the value of Minutes of Meeting /MOM in an office.	CO2	L2
c.	What is group communication? Give example.	CO1	L1
d.	Recall the structure of a formal report.	CO1	L1
e.	Differentiate between solicited and unsolicited proposal.	CO3	L2
f.	Define the 'process of communication'.	CO3	L1
g.	Name any two qualities of effective communication.	CO2	L1
h.	Classify different types of letters.	CO3	L2
i.	Compare circular and memorandum.	CO3	L2
j.	Infer the social communication.	CO5	L2
SECTION-B			
2.	Justify documentation in academic research.	CO2	L5
3.	Apply letter-writing skills in a leave application.	CO3	L3
4.	Develop a flowchart to explain Shannon-Weaver's model.	CO5	L3
5.	Compare formal letter with informal letter.	CO3	L4
SECTION-C			
6.	Evaluate the role of resume in your selection process.	CO4	L5
7.	Examine the value of formal etiquette in global businesses.	CO4	L4
8.	Develop a letter for the CEO of your company to request him for free medical service for your family as you are an old employee of the company.	CO5	L3
9.	Explain the process for professional meeting in an office.	CO1	L5

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MCA,Semester- 1st
ADVANCED DATA STRUCTURES
Subject Code: PGCA1952
M.Code: 79037
Date of Examination:11-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION B & C** have **FOUR** questions each.
3. Attempt any **FIVE** question of **SECTION B & C** carrying **TEN** marks each.
4. Select at least **TWO** questions from **SECTION B & C**.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List two examples of primitive data structures.	CO1	L-1
b.	What is Big-O notation?	CO1	L-1
c.	Illustrate the pivot element and its importance.	CO2	L-2
d.	Explain the collision in Hashing.	CO2	L-2
e.	Name any types of rotations in AVL Trees.	CO3	L-1
f.	Where are B-Trees commonly used?	CO3	L-1
g.	Interpret the Disjoint Set.	CO4	L-2
h.	Compare the directed and undirected graphs.	CO4	L-2
i.	Define the one real-world application of string operations.	CO5	L-1
j.	Classify the main idea of the Rabin-Karp algorithm.	CO5	L-2
SECTION-B			
2.	Make use of best case,worst case,average case and amortized time complexity of an algorithm.	CO1	L-3
3.	Analyze the Max heap from the following sequence of nodes and apply heap sort.Show all the intermediate steps. 3, 5, 9, 6, 8, 20, 10, 12, 18, 9	CO2	L-4

4.	Identify the Hash Function. Explain the properties of a good Hash Function.	CO2	L-3
5.	Discover the Red -black trees?Construct a red black tree for the following list with proper rotations and coloring . 7 , 5 , 6 , 3 , 9 , 14 , 15	CO3	L-4
SECTION-C			
6.	Classify how graphs are represented in memory? Explain in detail.	CO4	L-4
7.	Analyze the maximum flow problem. Explain the Ford–Fulkerson method with an example.	CO4	L-4
8.	Evaluate the different applications of string operations in real-world scenarios such as text editors, search engines, and bioinformatics.	CO5	L-5
9.	Construct the average-case and worst-case complexities of Brute Force and Rabin–Karp algorithms.	CO5	L-5

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Total No. of Pages: 02

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MCA, Semester- 1st

ADVANCED DATABASE MANAGEMENT SYSTEM

Subject Code: PGCA 1953

M.Code: 79038

Date of Examination: 13-12-2025

Time: 3 Hrs.**Max. Marks:70**

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE question of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the need for database administration?	CO-2	L-1
b.	List any two limitations of traditional file storage systems.	CO-1	L-1
c.	Recall the query optimization?	CO-5	L-1
d.	Show the transaction in DBMS?	CO-3	L-1
e.	Compare hierarchical and relational models.	CO-3	L-2
f.	Illustrate the heuristic optimization?	CO-4	L-2
g.	Classify the difference between data independence and data redundancy.	CO-1	L-2
h.	Explain the impact of concurrency control on system performance.	CO-4	L-2
i.	Compare inter-query and intra-query parallelism.	CO-5	L-2
j.	List types of integrity constraints and explain any one briefly.	CO-2	L-1
SECTION-B			
2.	Justify that backup and recovery strategies for a large-scale enterprise database is essential.	CO-3	L-5
3.	Explain Relational Algebra as a procedural query language. Describe the following operators with suitable examples: i) Selection (σ) ii) Projection (π) iii) Join ($\bowtie$)	CO-3	L-5
4.	Identify the different types of architecture of a DBMS with a neat diagram.	CO-1	L-3
5.	Examine the normalization and its forms with example.	CO-2	L-4

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SECTION-C			
6.	Analyze Spatial Databases by explaining spatial data types and methods of spatial data storage.	CO-5	L-4
7.	Apply SQL queries to implement constraints like primary key, foreign key, and check.	CO-5	L-3
8.	Evaluate the need for Big Data technologies, focusing on NoSQL databases.	CO-4	L-5
9.	Analyze the types of parallelism used in parallel databases. Differentiate between I/O Parallelism, Inter-query Parallelism, and Intra-query Parallelism.	CO-4	L-4

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Total No. of Questions: 09

Total No. of Pages: 01

MCA, Semester- 2nd
ADVANCED JAVA
Subject Code: PGCA1918
M.Code: 79617

Date of Examination: 23-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Distinguish between 'doGet()' and 'doPost()'.	CO1	L2
b.	What are Cookies?	CO1	L1
c.	Explain Session tracking in Servlet.	CO2	L2
d.	Define the JSP in detail.	CO2	L1
e.	List the various components of struts framework.	CO3	L1
f.	Explain EJB.	CO3	L2
g.	What is the role of POJO files in hibernate framework?	CO4	L2
h.	Show the MVC architecture in struts framework.	CO4	L1
i.	List the features of the object naming service in CORBA.	CO5	L1
j.	Illustrate the stubs used in RMI.	CO5	L2
SECTION-B			
2.	Identify the various JSP tags with example.	CO2	L3
3.	Analyze the different phases involved in the life cycle of a JSP.	CO2	L4
4.	Identify the various methods of Servlet in detail with a suitable example.	CO1	L3
5.	Explain the Struts framework with suitable example.	CO1	L5
SECTION-C			
6.	Explain the Java Bean Class with the help of a program.	CO3	L5
7.	Examine the Session Factory, Session, and Transaction components in Hibernate work together to ensure data persistence and consistency in a database.	CO4	L4
8.	Demonstrate how CRUD (Create, Read, Update, Delete) operations are performed in Hibernate with suitable example.	CO3	L3
9.	Explain the architecture of CORBA in detail with the help of diagram.	CO5	L5

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Total No. of Questions: 09

MCA, Semester-2nd
DESIGN AND ANALYSIS OF ALGORITHMS
 Subject Code: PGCA-1920
 M. Code: 79616
 Date of Examination: 20-12-2025

Max. Marks: 70

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATES:

1. SECTION A is **COMPULSORY**, consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTIONS B & C** have **FOUR** questions each.
3. Attempt any **FIVE** questions from **SECTIONS B & C**, carrying **TEN** marks each.
4. Select at least **TWO** questions from **SECTION B & C**.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:	CO1	L1
a.	Define an algorithm and explain its basic characteristics.	CO1	L1
b.	What is the purpose of analyzing an algorithm?	CO2	L2
c.	Explain the recursive algorithms.	CO3	L1
d.	What is Knapsack problem?	CO4	L2
e.	Illustrate Hamiltonian Circuit Problem and explain why it is NP-Complete.	CO2	L1
f.	What is a recursive algorithm? Give one example	CO3	L1
g.	What is binary search? Write its algorithm and explain its time complexity	CO3	L2
h.	Explain the sorted array.	CO1	L2
i.	Explain Big O notation with an example.	CO4	L2
j.	Illustrate any two algorithm used to solve the string matching problem.		
SECTION-B			
2.	Apply the principle of Branch and Bound to solve the Traveling Salesperson Problem (TSP).	CO2	L3
3.	Simplify the principles of algorithm design and discuss their importance in solving computational problems.	CO1	L4
4.	Analyze the importance of time and space complexity in evaluating algorithm efficiency. Compare both with suitable examples.	CO1	L4
5.	Evaluate the backtracking approach using the N-Queens problem. Discuss how it differs from the greedy approach.	CO2	L5
SECTION-C			
6.	Simplify the Breadth-First Search (BFS) and Depth-First Search (DFS) algorithms with examples. Compare their uses.	CO4	L4
7.	Evaluate how Dynamic Programming and Backtracking techniques help approximate solutions to NP-Hard problems.	CO4	L5
8.	Identify and explain the time complexity of Heap Sort.	CO3	L3
9.	Analyze the working of Radix Sort and evaluate its advantages over comparison-based sorting algorithms.	CO3	L5

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MCA , Semester- 2nd
INFORMATION SECURITY & CYBER LAW

Subject Code: PGCA1932

M.Code: 79619

Date of Examination:18-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION B & C** have **FOUR** questions each.
3. Attempt any **FIVE** question of **SECTION B & C** carrying **TEN** marks each.
4. Select at least **TWO** questions from **SECTION B & C**.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define security functional requirements.	CO1	L1
b.	What is Token-Based Authentication?	CO1	L1
c.	Outline the need for Database Security.	CO2	L2
d.	Explain the denial of Service (DoS)attacks.	CO2	L2
e.	What is Hacking?	CO3	L1
f.	Define the Role-Based Access Control in Information Security.	CO3	L1
g.	Illustrate the concept of Firewall.	CO4	L2
h.	Compare symmetric and asymmetric encryption.	CO4	L2
i.	What are the ISO Standards?	CO5	L1
j.	Explain Cyberspace.	CO5	L2
SECTION-B			
2.	Identify the concept confidentiality, integrity, and availability. How does each element contribute to the overall security of an information system.	CO1	L3
3.	Explain different access control policies adopted by organizations to protect information resources.	CO2	L5
4.	Analyze the differences between Password-Based, Token-Based, and Biometric Authentication in terms of security strength, cost, and user convenience.	CO2	L4
5.	Classify the different types of malicious software (malware) such as viruses, worms, Trojans, and spyware with suitable examples.	CO3	L4

SECTION-C			
6.	Explain the working principles of host-based intrusion detection Systems (HIDS) and network-based intrusion detection systems (NIDS). How do they differ in their approach?	CO4	L5
7.	Discuss the characteristics and functions of firewalls. Why are firewalls considered a critical part of network security infrastructure?	CO4	L6
8.	Analyze the symmetric encryption principles and discuss the working of the data encryption standard (DES) with a suitable block diagram.	CO5	L4
9.	Apply the concept of Digital Signature and its creation, verification process, and legal significance in securing electronic transactions.	CO5	L3

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MCA, Semester- 2nd

LINUX ADMINISTRATION

Subject Code: PGCA-1956

M.Code: 79618

Date of Examination: 02-01-2026

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Each question of SECTION B & C consists of TEN marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the key difference between Linux and Windows kernels?	CO1	L1
b.	Explain the role of the root directory in a Linux file system.	CO1	L2
c.	Discuss the commands used to move or rename a file in Linux.	CO2	L2
d.	Write a short note on Linux boot process.	CO2	L1
e.	Describe how the chmod command is used to change file permissions in Linux.	CO2	L2
f.	List the characteristics of a package and a folder in Windows.	CO3	L1
g.	Compare GRUB and LILO.	CO3	L2
h.	Summarize the role of SMTP in email communication.	CO3	L2
i.	Write a short note on HTTP protocol?	CO4	L1
j.	Explain the role of the Samba server.	CO4	L2
SECTION-B			
2.	Analyze the role of the Linux root user and compare it with Windows administrator accounts.	CO1	L3
3.	Describe the Linux booting and shutting down processes in detail. Discuss the significance of the runlevels in the boot process.	CO2	L4

4.	Evaluate the Linux file structure and hierarchy, highlighting its advantages and potential limitations.	CO1	L5
5.	Examine the role of vi text editor in Linux. Explain insertion and command modes, give any 5 commands in detail.	CO2	L4
SECTION-C			
6.	Demonstrate the process of installing and configuring a DNS server by setting up BIND database files and configuring DNS clients.	CO3	L3
7.	Explain the key concepts of the HTTP protocol and its role in web communication. Discuss how Apache is utilized for hosting websites?	CO4	L5
8.	Demonstrate the differences between POP and IMAP protocols and demonstrate how each is used in managing email accounts.	CO4	L4
9.	Explain the advantages of using Samba for remote sharing in Windows and Linux environments.	CO3	L5

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Total No. of Pages: 02

Total No. of Questions: 09

MCA, Semester- 2nd
WEB TECHNOLOGIES
Subject Code: PGCA-1909

M. Code: 79615

Date of Examination: 15-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Each question of SECTION B & C consists of TEN marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define an IP address.	CO1	L1
b.	What is HTML and its basic structure.	CO2	L1
c.	List any two types of hyperlinks used in HTML.	CO3	L1
d.	Name any two form elements used to capture user data in HTML.	CO4	L1
e.	Recall what TCP/IP stands for.	CO5	L1
f.	Explain how the attributes cellpadding, cellspacing, and border enhance the readability and appearance of an HTML table.	CO1	L2
g.	Differentiate between a programming language and a markup language with examples.	CO3	L2
h.	Interpret the difference between internal links and external links in HTML.	CO2	L2
i.	Describe how JavaScript captures user input from form elements.	CO2	L2
j.	Relate how front-end HTML forms are connected to back-end servers for data processing.	CO2	L2
SECTION-B			
2.	Apply your understanding of IP addressing to explain how unique IPs are assigned to systems and how they enable Internet communication.	CO1	L3

3.	Develop an HTML code snippet that creates a table with merged cells using 'COLSPAN' and 'ROWSPAN'. Explain the purpose of each attribute.	CO3	L4
4.	Analyze how the '' tag contributes to webpage design. Write HTML code to insert an image with alternate text and defined dimensions.	CO2	L4
5.	Evaluate the role of fundamental Internet concepts such as domain names, and client-server architecture in ensuring efficient and secure digital communication. Which concept do you consider most critical, and why?	CO2	L5
SECTION-C			
6.	Evaluate how platform independence supports modern web application deployment. Provide a relevant example.	CO5	L5
7.	Analyze how different types of hyperlinks (external document references, internal document references, and image-based hyperlinks) can be used together to design a fully connected multipage website.	CO3	L4
8.	a. Create an HTML Program using '<FRAMESET>' and '<FRAME>' tags to divide a web page into multiple sections. b. Demonstrate how different webpages can be displayed within each frame through practical implementation.	CO4	L6
9.	Demonstrate the use of Checkbox and Radio elements.	CO4	L5

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Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

MCA, Semester- 3rd

E-COMMERCE AND DIGITAL MARKETING

Subject Code: PGCA1921

M.Code: 90807

Date of Examination: 26.11.2025

Time: 3 Hrs.**Max. Marks: 70**

INSTRUCTIONS TO CANDIDATES:

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
- 2. SECTION B & C have FOUR questions each.**
- 3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.**
- 4. Select at least TWO questions from SECTION B & C.**

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define e-business.	CO1	L1
b.	Explain how customers benefit from e-commerce.	CO1	L2
c.	What is a digital signature?	CO2	L1
d.	Describe the working of UPI in India.	CO2	L2
e.	Define web analytics.	CO3	L1
f.	Illustrate a successful viral marketing campaign with an example.	CO3	L2
g.	List three popular social media platforms used in marketing.	CO4	L1
h.	Explain the importance of off-page optimization.	CO4	L2
i.	What is remarketing in digital advertising?	CO5	L1
j.	Compare mobile ads with desktop ads.	CO5	L2
SECTION-B			
2.	Illustrate how hypertext publishing can enhance e-commerce applications with examples.	CO1	L3
3.	Analyze the differences between traditional and electronic payment systems.	CO2	L4
4.	Evaluate the efficiency of PayPal or UPI as electronic payment systems.	CO2	L5
5.	Evaluate the role of web presence and content creation in digital marketing success.	CO3	L5
SECTION-C			
6.	Apply digital display advertising strategies to improve product awareness for a new mobile app.	CO4	L3
7.	Examine the role of search engine marketing in driving traffic compared to social media campaigns.	CO5	L4

8.	Critically assess how keyword research influences the visibility and credibility of a brand's web presence. Provide an example to justify your evaluation.	CO5	L5
9.	Demonstrate how email marketing and forums can be integrated into a single marketing strategy.	CO3	L3

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 09

MCA, Semester- 3rd

ADVANCED COMPUTER NETWORKING

Subject Code: PGCA1925

M.Code: 90798

Date of Examination: 08-12-2025

Time: 3 Hrs.**Max. Marks: 70**

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE question of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List any two uses of computer networks.	CO1	L1
b.	Explain layered network architecture.	CO1	L2
c.	Define Selective Repeat ARQ.	CO2	L1
d.	Illustrate HDLC protocol.	CO2	L2
e.	Define cell splitting in reference to mobile network.	CO3	L1
f.	Explain wireless communication.	CO3	L2
g.	List any two protocols used in adhoc networks.	CO3	L1
h.	Compare analog and digital signal.	CO4	L2
i.	What is 2G cellular network?	CO4	L1
j.	Classify framing in data link layer (any two).	CO2	L2
SECTION-B			
2.	Identify the types of multiplexing? Compare all with help of diagram?	CO1	L3
3.	Examine error detection techniques: parity check, checksum, and CRC.	CO2	L4
4.	Explain token bucket algorithm for congestion control with the help of diagram.	CO3	L5
5.	Determine the functions of the seven layers of the OSI model with the help of diagram.	CO1	L5
SECTION-C			
6.	Identify the pure ALOHA protocol with throughput analysis.	CO3	L3
7.	Examine subnetting with the help of diagram. Also give an example to explain the concept.	CO4	L4
8.	Analyze the features of TCP and UDP protocols.	CO3	L5
9.	Explain the working of World Wide Web (WWW), Email system and file transfer protocol on network.	CO4	L4

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Total No. of Pages:01

Total No. of Questions: 09

MCA Semester- 3rd
ARTIFICIAL INTELLIGENCE & SOFT COMPUTING

Subject Code: PGCA 1926

M.Code: 90799

Date of Examination: 02-12-2025

Time: 3 Hrs.**Max. Marks: 70****INSTRUCTIONS TO CANDIDATES:**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION B & C have FOUR questions each.**
3. **Attempt any FIVE question from SECTION B & C carrying TEN marks each.**
4. **Select at least TWO questions from SECTION B & C.**

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Identify two domains of Artificial Intelligence.	CO1	L2
b.	What is backward chaining?	CO1	L2
c.	Define hill climbing.	CO2	L1
d.	Explain the difference between uninformed and informed search techniques.	CO2	L2
e.	Explain the concept of supervised learning in machine learning.	CO3	L1
f.	Interpret the concept of Adaptive Resonance Theory (ART).	CO3	L2
g.	What is inference in fuzzy logic?	CO4	L1
h.	Summarize two applications of fuzzy systems.	CO4	L2
i.	List the types of hybrid soft computing system.	CO5	L1
j.	Explain the working principle of a genetic algorithm.	CO5	L2
SECTION-B			
2.	Identify the challenges in inference using first-order logic.	CO1	L3
3.	Analyze the role of pragmatics in natural language processing.	CO2	L4
4.	Explain the significance of learning rules in neural networks.	CO3	L5
5.	Compare toy problems and real-world problems in AI.	CO1	L5
SECTION-C			
6.	Identify the role of fuzzy relations in decision-making systems.	CO4	L3
7.	Analyze different encoding methods used in genetic algorithms.	CO5	L4
8.	Explain the real-world applications of soft computing for efficiency.	CO3	L5
9.	Apply fuzzification and defuzzification methods in a fuzzy logic control system.	CO4	L3

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Total No. of Pages: 01

Total No. of Questions: 09

MCA, Semester- 3RD
THEORY OF COMPUTATION
Subject Code: PGCA1927
M.Code: 90800

Date of Examination: 29-11-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION B & C** have **FOUR** questions each.
3. Attempt any **FIVE** question from **SECTION B & C** carrying **TEN** marks each.
4. Select at least **TWO** questions from **SECTION B & C**.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define diagonal argument.	CO1	L1
b.	Compare DFA and NDFA.	CO1	L2
c.	List the operations on regular languages.	CO2	L1
d.	Explain the use of pumping lemma in proving non-regularity.	CO2	L2
e.	What is ambiguity in CFG?	CO3	L1
f.	State the difference between CNF and GNF.	CO3	L2
g.	What is a tape alphabet?	CO4	L1
h.	Analyze the Recursive Languages with examples.	CO4	L2
i.	What is an unrestricted grammar?	CO5	L1
j.	Differentiate between solvable and unsolvable problems.	CO5	L2
SECTION-B			
2.	Construct an example showing the difference between language and grammar.	CO1	L3
3.	Analyze the properties of CFLs with examples.	CO2	L4
4.	Evaluate how grammar simplification enhances parser efficiency.	CO3	L5
5.	Evaluate the equivalence of two automata by giving any example.	CO2	L5
SECTION-C			
6.	Construct a TM equivalent to a context-sensitive grammar. By taking suitable example.	CO4	L3
7.	Explain the Halting Problem and prove its undesirability.	CO5	L4
8.	Compare all four types of Chomsky Hierarchy with their acceptors.	CO5	L5
9.	Construct a CFG for balanced parentheses.	CO3	L3

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Total No. of Pages:02

Total No. of Questions: 09

MCA, Semester-3rd

SOFTWARE PROJECT MANAGEMENT

Subject Code: PGCA1930

M.Code: 90801

Date of Examination: 05-12-2025

Time: 3 Hrs.**Max. Marks: 70**

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION B & C have FOUR questions each.
3. Attempt any FIVE question of SECTION B & C carrying TEN marks each.
4. Select at least TWO questions from SECTION B & C.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What are the main processes involved in initiating a project?	CO1	L1
b.	Summarize the role of risk evaluation in software projects.	CO1	L2
c.	Define cash flow forecasting in project management.	CO2	L1
d.	Interpret Project Cost Estimate with an example.	CO2	L2
e.	What are the main processes involved in initiating a project?	CO1	L1
f.	Explain evaluation techniques with an example.	CO3	L2
g.	Define controlling quality in project management.	CO3	L1
h.	Illustrate directing and managing Project Work with an example.	CO4	L2
i.	Recall types of Contracts in project management.	CO4	L1
j.	Illustrate Schedule Compression with an example.	CO3	L2
SECTION-B			
2.	Choose an example related to planning for risks in project management.	CO1	L3
3.	Discover a project's COCOMO II estimate and explain variances against historical data.	CO2	L4
4.	Conclude the importance of Software Project Management Activities in project success.	CO2	L5
5.	Prioritize the impact of organizational structure on team communication and propose reorganization options.	CO3	L5

SECTION-C			
6.	Utilize earned value analysis to track project performance.	CO3	L3
7.	Analyze relationships between stress, health, and project performance.	CO4	L4
8.	Interpret stress management techniques for a project team under tight deadlines.	CO4	L5
9.	Develop a work plan for executing a project using a Gantt chart.	CO4	L3

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Total No. of Pages: 02

Total No. of Questions: 09

MCA, Semester- 4th
ADVANCED WEB TECHNOLOGIES

Subject Code: PGCA 1958

M.Code: 91856

Date of Examination: 05-12-2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION B & C have **FOUR** questions each.
3. Each question of SECTION B & C consists of **TEN** marks.
4. Attempt any **FIVE** questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define server-side scripting. Mention any two examples.	CO1	L1
b.	Compare static and dynamic web pages.	CO1	L2
c.	What is XML? Mention any two advantages of using XML	CO2	L1
d.	Explain AJAX and its uses.	CO3	L2
e.	Classify the web services? Give one real-life example.	CO6	L2
f.	Recall the components of the API.	CO5	L1
g.	Summarize the uses of ReactJS.	CO6	L2
h.	What is 'type conversion' in PHP ?	CO4	L1
i.	Illustrate CRUD. Define any two operations.	CO5	L2
j.	How Date picker is used in JQuery. Explain with the help of an example.	CO4	L1
SECTION-B			
2.	Explain the uses and benefits of the content management system in detail.	CO6	L5
3.	Identify the various predefined constants in PHP? Explain the use of the constant() functions in PHP.	CO4	L3
4.	Evaluate the role of PHP-MySQL integration in dynamic website development. Provide suitable examples.	CO4	L5
5.	Compare the client-side and server-side programming. Describe the request-response cycle of a web application.	CO1	L4
SECTION-C			
6.	Discuss various data types of XML and also explain how to create XML documents with the help of example	CO2	L6

7.	Explain the Bootstrap and its components.	CO5	L5
8.	Compare AJAX with traditional form submission. Discuss how AJAX improves user experience.	CO3	L4
9.	Construct the Node JS in detail with examples.	CO5	L3

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SECTION-C

6.	Compare transactions with traditional payment systems in terms of speed, cost, and scalability, and discuss the trade-offs involved.	CO3	L4
7.	Explain how Blockchain technology is applied in Supply Chain emphasizing transparency and security benefits.	CO4	L5
8.	Identify different security attacks in Blockchain, emphasizing the 51% majority attack and its implications on network integrity.	CO4	L3
9.	Evaluate Bitcoin script and discuss the peer-to-peer (P2P) network components that enable decentralized transaction validation in the Bitcoin system.	CO3	L5

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Total No. of Pages: 2

Total No. of Questions: 09

MCA, Semester- 4th
MACHINE LEARNING & DATA ANALYTICS USING PYTHON

Subject Code: PGCA1976

M.Code: 91855

Date of Examination: 29.11.2025

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION B & C** have **FOUR** questions each.
3. Attempt any **FIVE** question of **SECTION B & C** carrying **TEN** marks each.
4. Select at least **TWO** questions from **SECTION B & C**.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Explain array indexing.	CO3	L2
b.	Define logistic regression.	CO2	L1
c.	Explain bar plot.	CO5	L2
d.	Illustrate about classification in Python.	CO2	L2
e.	Why is Machine Learning important?	CO1	L1
f.	List the different Python modules.	CO4	L1
g.	Recall the main goal of clustering.	CO3	L2
h.	What is the difference between training data and testing data?	CO1	L1
i.	Outline the role of series and DataFrame.	CO4	L2
j.	What is a scatter plot?	CO5	L1
SECTION-B			
2.	Apply the learning process in supervised and unsupervised learning. How does the availability of labeled data affect the performance and outcome of these algorithms?	CO1	L3
3.	Compare and contrast Linear Classification and Logistic Regression in terms of their use cases, output types, and model interpretation. Provide examples where each method is suitable.	CO2	L4
4.	Analyze and compare Decision Trees and Naive Bayes on a sample dataset in terms of accuracy and overfitting.	CO3	L4
5.	Evaluate how neural networks improve prediction accuracy using a practical dataset example.	CO3	L5
SECTION-C			
6.	Apply Python functions and modular programming to automate a dataset analysis workflow.	CO4	L3

7.	Analyze arithmetic, comparison, and logical operators in Python with best practices for applying them.	CO4	L4
8.	Evaluate the differences between histograms and bar charts with Matplotlib examples.	CO5	L5
9.	Construct the grids and subplots in data visualization, explaining their roles, differences, and applications	CO5	L3

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