

Roll No.

Total No. of Pages: 01

Total No. of Questions: 09

MCA, Semester- 1st
Technical Communication
Subject Code: 25C2CAP-105/PGCA1905
M. Code: 96552/79039
Date of Examination: 19-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Differentiate between various aspects of paragraph writing.	CO-2	L-2
b.	List key features of group discussions and conferences.	CO-1	L-1
c.	Explain the process of presentation techniques.	CO-5	L-2
d.	Write the process of research papers in brief.	CO-5	L-1
e.	Compare various aspects of dissertation.	CO-3	L-2
f.	State key features of models of communication.	CO-4	L-1
g.	Describe the process of dissertation in brief.	CO-1	L-2
h.	Outline the steps followed in functions of communication.	CO-4	L-2
i.	Define any two points related to technical writing.	CO-5	L-1
j.	What is cross-cultural communication?	CO-2	L-1
SECTION-B			
2.	Explain the steps of précis writing with an example.	CO-2	L-5
3.	Analyze the importance of vocabulary in comprehension.	CO-3	L-4
4.	Apply principles of report writing to draft a lab report.	CO-1	L-3
5.	Evaluate barriers to communication in multinational companies.	CO-3	L-5
SECTION-C			
6.	Apply communication skills to conduct a classroom seminar and formal communication in a job interview.	CO-4	L-3
7.	Examine the impact of cultural diversity in communication.	CO-5	L-4
8.	Justify the use of formal etiquette in global businesses.	CO-4	L-5
9.	Compare downward and upward communication with examples.	CO-4	L-4

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1|M-96552/79039

Roll No.

Total No. of Pages:01

Total No. of Questions: 09

MCA, Semester- 1st
ADVANCED DATA STRUCTURES
Subject Code: 25C2CAP-103
M.Code:
Date of Examination:12-05-2026

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. 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.	CO-1	L1
b.	Define homogeneous and non-homogeneous data structures.	CO-1	L1
c.	Describe the concept of Big-O notation.	CO-2	L2
d.	Outline the main limitation of Direct Address Tables.	CO-2	L2
e.	State the recurrence relation used in merge sort.	CO-3	L1
f.	Name the properties of a Red-Black Tree.	CO-3	L1
g.	Explain the concept of the All Pairs Shortest Paths problem in graph algorithms.	CO-4	L2
h.	Illustrate the structure and properties of a binomial heap.	CO-4	L2
i.	Write the advantage of adjacency list representation over adjacency matrix.	CO-5	L1
j.	Explain the basic string operations performed in data structures.	CO-5	L2
SECTION-B			
2.	Apply the concept of best case, worst case, average case, and amortized time complexity in analyzing the performance of an algorithm with suitable examples.	CO-1	L3

3.	Compare Quick Sort, Heap Sort, Counting Sort, and Bucket Sort in terms of time and space complexity and interpret their efficiency differences.	CO-2	L4
4.	Write the concept of collision in hashing and demonstrate various collision resolution techniques such as chaining and open addressing using suitable examples.	CO-2	L3
5.	Analyze Red-Black Trees by constructing a Red-Black Tree for the given sequence and explaining the required rotations and color adjustments for each insertion. 7, 5, 6, 3, 9, 14, 15	CO-3	L4
SECTION-C			
6.	Compare adjacency matrix and adjacency list representations of graphs with suitable examples along with their advantages and disadvantages.	CO-4	L4
7.	Analyze the maximum flow problem and examine the Ford-Fulkerson algorithm with step-by-step illustration using an example.	CO-4	L4
8.	Justify the use of string operations in real-world applications including text editors, search engines, and bioinformatics with relevant examples.	CO-5	L5
9.	Compare adjacency matrix and adjacency list representations of graphs with suitable examples along with their advantages and disadvantages.	CO-5	L5

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Total No. of Pages: 01

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MCA, Semester- 1st
ADVANCED DATABASE MANAGEMENT SYSTEM
Subject Code: 25C2CAP-104/PGCA1953
M.Code: 96553/79038
Date of Examination: 15-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Differentiate between 1:1 and 1:M relationships.	CO-2	L-2
b.	List any two limitations of traditional file storage systems.	CO-1	L-1
c.	Explain the process of distributed query processing.	CO-5	L-2
d.	State failure classification in recovery with example.	CO-5	L-1
e.	Compare partial dependency and transitive dependency.	CO-3	L-2
f.	Name two applications of XML databases.	CO-4	L-1
g.	Describe the impact of concurrency control on system performance.	CO-1	L-2
h.	Give two examples of spatial applications.	CO-4	L-2
i.	Define BASE properties of NoSQL.	CO-5	L-1
j.	What is cardinality in ER model?	CO-2	L-1
SECTION-B			
2.	Explain functional dependency and its types with suitable examples.	CO-2	L-5
3.	Analyze a query execution plan and suggest optimization techniques.	CO-3	L-4
4.	Construct a diagram representing the three-level architecture of a DBMS.	CO-1	L-3
5.	Evaluate transaction recovery techniques and justify the most efficient one.	CO-3	L-5
SECTION-C			
6.	Apply a distributed database schema and its different data distribution strategies.	CO-4	L-3
7.	Classify distributed database recovery methods and suggest improvements.	CO-5	L-4
8.	Appraise the performance of relational calculus queries for efficiency.	CO-4	L-5
9.	Design a database integrating relational, temporal and spatial data models.	CO-4	L-6

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Total No. of Pages: 02

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MCA, Semester- 1st

DISCRETE STRUCTURES AND OPTIMIZATION

Subject Code: PGCA1917 / 25C2CAP-101

M.Code:79035 / 96556

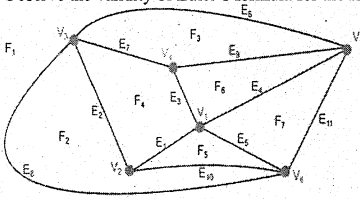
Date of Examination: 06-05-2026

Time: 3 Hrs.

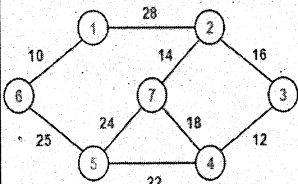
Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

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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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define finite and infinite set.	CO-1	L1
b.	Differentiate proper subset and improper subset.	CO-1	L2
c.	What are finite and infinite groups?	CO-2	L1
d.	There are 15 points in a plane, no three of which are in a straight line except 6 all of which are in one straight line. Obtain the number of lines that can be formed by joining them?	CO-3	L2
e.	Define connectivity, connected and disconnected graphs.	CO-4	L1
f.	What is the number of regions defined by a connected planar graph with 4 nodes and 8 edges? Draw such a graph.	CO-4	L2
g.	State generalized Pigeon Hole Principal.	CO-3	L1
h.	Observe the validity of Euler's formula for the following graph	CO-4	L2
			
i.	Recall Inclusion-Exclusion Principle	CO-1	L1
j.	Interpret the set $G = \{1, \omega, \omega^2\}$ of cube root of unity as a group under multiplication.	CO-2	L2
SECTION-B			
2.	Write and drive De Morgan's Law for $(A \cup B)^c$ and $(A \cap B)^c$ sets.	CO-1	L3

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3.	Describe the concept of composition of function. Figure out the nature of function $f: A \rightarrow B$ and $g: B \rightarrow C$ if $g \circ f$ is bijective function.	CO-1	L4
4.	Imagine a scenario where the population of mosquito in a colony multiplies by every 4 days (i) How would you determine a recurrence relation for the number of mosquitos after n days? (ii) If a colony begins with 50 mosquitos and population grows by a factor of 5 every day, Evaluate the number of mosquitos will be present in the colony after 8 days?	CO-3	L5
5.	If $S(n)-6S(n-1)+5(n-2)=0$, with $S(0)=S(1)=2$ find generating function.	CO-3	L5
SECTION-C			
6.	Explain Prim's algorithm and employ the same to figure out minimal spanning tree of the following weighted graph 	CO-4	L4
7.	Let $G = \{\pm 1, \pm i, \pm j, \pm k\}$ is a group with product defined as $i^2 = j^2 = k^2 = -1$, $i.j = k = -j.i$, $j.k = i = -k.j$, $k.i = j = -i.k$. Discuss the terminology of order of element and apply the aforementioned operations to compute order of elements of G to drive $O(i,j) \neq O(i), O(j)$.	CO-2	L3
8.	Define cosets and quotient group. Find the member of quotient group G/H if $G = (Z, +)$ and $H = \{4n: n \in Z\}$.	CO-2	L5
9.	Evaluate the post fix expression $7\ 2\ 3\ * - 4\ 9\ 3\ +$	CO-4	L5

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MCA, Semester- 1st
PROGRAMMING IN PYTHON
Subject Code: 25C2CAP-102
M.Code: 79036
Date of Examination: 08-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Label the changeable and non-changeable data types in Python.	CO-1	L1
b.	Explain the use of logical operators in decision-making statements.	CO-1	L2
c.	List any two limitations of Python compared to C++.	CO-2	L1
d.	Demonstrate the working of dictionary to access and modify elements?	CO-3	L2
e.	Write the syntax for defining a function in Python.	CO-4	L1
f.	Describe how multiple exceptions can be handled in one try block.	CO-4	L2
g.	What is the output of the following code? x = [1, 2, 3]; x.append(4); print(x).	CO-3	L1
h.	Differentiate between parameters and arguments in a Python function.	CO-4	L2
i.	Define an operator and give any two examples used in Python.	CO-1	L1
j.	Interpret the output of the following code: a = 10; b = 20; print(a > 5 and b < 15).	CO-2	L2
SECTION-B			
2.	Execute a program that takes user input and checks whether it is numeric, alphabetic, or alphanumeric.	CO-1	L3
3.	Identify the equivalent programs in Python and C to print "Hello World" and compare the syntax.	CO-2	L3
4.	Analyze the differences between lists and tuples in Python with respect to their mutability with examples.	CO-3	L4
5.	Evaluate how using dictionary data type improves data organization compared to lists.	CO-3	L5
SECTION-C			
6.	Compare exception propagation behavior between nested try-except blocks.	CO-4	L4
7.	Examine the role of exception handling in improving the security of file handling for data storage.	CO-4	L4
8.	Determine inheritance by creating a base class Bird and a derived class Eagles also explain its working.	CO-5	L5
9.	Analyze the difference between instance, class, and static methods in Python.	CO-5	L5

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MCA, Semester- 2nd

LINUX ADMINISTRATION

Subject Code: 25C2CAP-204/PGCA1956

M.Code: 98003/79618

Date of Examination: 11-05-2026

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.

from each section.			
Q. No.	Question	CO	BL
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.	Which commands are used to move or rename a file in Linux?	CO2	L1
d.	Name the three primary operational modes of the vi editor.	CO1	L1
e.	State the steps to create Samba share in smb.conf.	CO2	L2
f.	List the characteristics of a package and a folder in Windows.	CO3	L1
g.	Illustrate the basic steps to start and shut down the Apache server.	CO3	L2
h.	Describe the main function of the SMTP protocol in email services.	CO4	L2
i.	Write a short note on HTTP protocol.	CO4	L1
j.	Explain the role of the Samba server.	CO4	L2
SECTION-B			
2.	Apply the concepts of the Graphical User Interface (GUI) and the Kernel in Linux to identify advantages over monolithic operating systems.	CO1	L3
3.	Compare advanced vi editor commands. Distinguish between file-saving, searching, replacing and navigation commands.	CO2	L4
4.	Evaluate the Linux file structure and hierarchy, highlighting its advantages and potential limitations.	CO1	L5
5.	Explain the Linux booting and shutting down processes in detail and the significance of the run levels in the boot process.	CO2	L5
SECTION-C			
6.	Apply the process of safely starting, stopping, and restarting to the Postfix mail server while ensuring email delivery continuity.	CO3	L3
7.	Explain the key concepts of the HTTP protocol and the utilization of Apache HTTP Server for hosting websites.	CO4	L5
8.	Analyze the differences between POP3 protocol and IMAP protocol and their use in managing email accounts.	CO4	L4
9.	Evaluate the steps to install Samba users server configure authentication for access through a Windows Server environment along with its advantages.	CO3	L5

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Total No. of Pages: 01

Total No. of Questions: 09

MCA, Semester- 2nd

INFORMATION SECURITY & CYBER LAW

Subject Code: 25C2CAP-205

M.Code: 98002

Date of Examination: 18-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define Network-Based Intrusion Detection System (NIDS) and mention two advantages.	CO-3	L1
b.	Interpret the concept of a digital signature and its role in ensuring secure online communication.	CO-4	L2
c.	Describe ISO standards related to information security? Give one example.	CO-4	L2
d.	List any four differences between a Computer Virus and a Worm.	CO-1	L1
e.	Explain why programmers sometimes create Backdoors.	CO-2	L2
f.	Define Zombie as malicious software.	CO-1	L1
g.	Show the CIA triad in information Security with the help of diagram.	CO-2	L1
h.	Outline two limitations of DES in modern cryptography in present-day cryptography.	CO-3	L2
i.	Show two defenses against Denial-of-Service Attacks.	CO-1	L1
j.	Explain Discretionary Access Control (DAC) with the help of a diagram.	CO-2	L2
SECTION-B			
2.	Write the type of intruder's in a case when a hacker gains access to your system but leaves no trace. How would you detect such activity?	CO-3	L3
3.	List the CIA security principles and analyze the impact of violating each	CO-1	L4

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	principle in real-world information systems		
4.	Determine the need for database security by analyzing database access control and encryption techniques	CO-1	L5
5.	Compare password-based, token-based, and biometric authentication methods.	CO-1	L5
SECTION-C			
6.	Identify the major security issues in IPv4 networks, and how they can be addressed?	CO- 4	L3
7.	Explain IT Act 2000 in detail. Also discuss if there were any amendments made in IT Act 2000.	CO-3	L5
8.	Determine the challenges associated with remote user authentication in distributed environments. Propose suitable security measures to overcome these challenges and justify your recommendations.	CO- 2	L5
9.	Examine the role of symmetric encryption contributes to secure communication and evaluate its strengths and limitations in protecting data.	CO-4	L4

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04/05 (M)

Total No. of Questions: 09

Total No. of Pages: 01

MCA, Semester- 2nd

ADVANCED JAVA

Subject Code: 25C2CAP-203 / PGCA1918

M.Code: /79617

Date of Examination: 04/05/2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Explain which class provides HTTP-specific servlet functionality.	CO1	L2
b.	Name the interface used to send responses to clients.	CO1	L1
c.	Explain the JSP execution steps with reference to its life cycle phases.	CO2	L2
d.	Which JSP implicit object is utilized to retrieve data from a client request?	CO2	L1
e.	List the basic steps involved in deploying a Struts application.	CO3	L1
f.	Differentiate between Struts Action and Struts Form Bean.	CO3	L2
g.	State the main role of the EJB container in enterprise applications.	CO4	L2
h.	How does Hibernate use getter and setter methods in POJOs?	CO4	L1
i.	Define the role of a stub class in distributed systems.	CO5	L1
j.	Describe the main components of CORBA architecture.	CO5	L2
SECTION-B			
2.	Develop the architecture of JSP and utilize a suitable model to outline how JSP interacts with Servlets, and organize the request-response workflow in a web application.	CO2	L3
3.	Compare and analyze JSP standard actions and custom tag libraries in terms of functionality and maintainability.	CO2	L4
4.	Develop a Servlet using the Servlet API to handle HTTP GET and POST requests.	CO1	L3
5.	Explain the use of sendRedirect and RequestDispatcher.forward() in request handling. Also compare its working in detail.	CO1	L5
SECTION-C			
6.	Analyze the deployment process of a Struts application and examine its integration with database connectivity.	CO3	L5
7.	Compare Stateful Session Bean with Stateless Session Bean with suitable examples.	CO4	L4
8.	Construct CRUD (Create, Read, Update, Delete) operations in Hibernate by utilizing an appropriate model, selecting suitable methods, and organizing the workflow with a relevant example.	CO3	L3
9.	Explain the architecture of CORBA in detail with the help of diagram.	CO5	L5

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MCA, Semester- 2nd
DESIGN & ANALYSIS OF ALGORITHMS
Subject Code: 25C2CAP-202 / PGCA 1920
M. Code: 179616
Date of Examination: 07-05-2026

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. 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.	Write the concept of deterministic algorithms and its applications.	CO1	L1
b.	Describe asymptotic analysis and the significance of asymptotic notations.	CO1	L2
c.	Interpret the working of recursion in problem-solving.	CO2	L2
d.	Define the basic principle of the greedy algorithm and mention its main features.	CO2	L1
e.	Describe the working principle of Radix Sort.	CO3	L2
f.	Identify the concept of graph traversal.	CO3	L1
g.	Explain the purpose of Dijkstra's algorithm in finding the shortest path in a weighted graph.	CO4	L2
h.	State the meaning of NP-Hard problems and identify the difference between NP-Hard and NP-Complete problems.	CO4	L1
i.	Describe the concept of Depth First Search (DFS) in graph traversal.	CO4	L2
j.	Describe the concept of overlapping sub-solutions in Dynamic Programming.	CO1	L2
SECTION-B			
2.	Apply the principles of asymptotic analysis to determine and interpret the time complexity of a non-recursive algorithm under different input conditions.	CO1	L3
3.	Examine the working of the backtracking technique for solving the Subset-Sum Problem with a suitable illustration.	CO2	L4
4.	Interpret the use of the Bubble Sort algorithm to arrange the following dataset in ascending order. Illustrate each pass of the sorting process and calculate the total number of comparisons required. Example dataset :{ 25, 12, 9, 30, 18}.	CO3	L5
5.	Evaluate the effectiveness of alternative strategies for solving the Travelling Salesman Problem (TSP), including brute force, greedy algorithms, and dynamic programming, by comparing their computational complexity, solution quality, and practical applicability in real-world scenarios	CO2	L5
SECTION-C			
6.	Use the concept of NP-Hard problems to determine appropriate solution strategies for real-world computational challenges.	CO4	L3
7.	Solve the Quick Sort technique for the array [38, 27, 43, 3, 9, 82, and 10] and illustrate the partitioning process step-by-step.	CO3	L3
8.	Explain the Heap Sort process by constructing a max-heap for the dataset {20, 7, 15, 3, 10, 5} and analyzing each stage of sorting for correctness and efficiency.	CO3	L5
9.	Evaluate the application of the Depth-First Search (DFS) algorithm in traversing a given graph by illustrating the order of visiting vertices and justifying each step involved in the traversal process.	CO4	L5

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MCA, Semester- 2nd
DESIGN & ANALYSIS OF ALGORITHMS
Subject Code: 25C2CAP-202 / PGCA 1920
M. Code: 179616
Date of Examination: 07-05-2026

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

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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.	Write the concept of deterministic algorithms and its applications.	CO1	L1
b.	Describe asymptotic analysis and the significance of asymptotic notations.	CO1	L2
c.	Interpret the working of recursion in problem-solving.	CO2	L2
d.	Define the basic principle of the greedy algorithm and mention its main features.	CO2	L1
e.	Describe the working principle of Radix Sort.	CO3	L2
f.	Identify the concept of graph traversal.	CO3	L1
g.	Explain the purpose of Dijkstra's algorithm in finding the shortest path in a weighted graph.	CO4	L2
h.	State the meaning of NP-Hard problems and identify the difference between NP-Hard and NP-Complete problems.	CO4	L1
i.	Describe the concept of Depth First Search (DFS) in graph traversal.	CO4	L2
j.	Describe the concept of overlapping sub-solutions in Dynamic Programming.	CO1	L2
SECTION-B			
2.	Apply the principles of asymptotic analysis to determine and interpret the time complexity of a non-recursive algorithm under different input conditions.	CO1	L3
3.	Examine the working of the backtracking technique for solving the Subset-Sum Problem with a suitable illustration.	CO2	L4
4.	Interpret the use of the Bubble Sort algorithm to arrange the following dataset in ascending order. Illustrate each pass of the sorting process and calculate the total number of comparisons required. Example dataset : { 25, 12, 9, 30, 18}.	CO3	L5
5.	Evaluate the effectiveness of alternative strategies for solving the Travelling Salesman Problem (TSP), including brute force, greedy algorithms, and dynamic programming, by comparing their computational complexity, solution quality, and practical applicability in real-world scenarios	CO2	L5
SECTION-C			
6.	Use the concept of NP-Hard problems to determine appropriate solution strategies for real-world computational challenges.	CO4	L3
7.	Solve the Quick Sort technique for the array [38, 27, 43, 3, 9, 82, and 10] and illustrate the partitioning process step-by-step.	CO3	L3
8.	Explain the Heap Sort process by constructing a max-heap for the dataset {20, 7, 15, 3, 10, 5} and analyzing each stage of sorting for correctness and efficiency.	CO3	L5
9.	Evaluate the application of the Depth-First Search (DFS) algorithm in traversing a given graph by illustrating the order of visiting vertices and justifying each step involved in the traversal process.	CO4	L5

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Total No. of Pages: 01

MCA, Semester- 2nd
WEB TECHNOLOGIES
Subject Code: 25C2CAP-201/ PGCA1909
M.Code: 98006 / 79615
Date of Examination: 14-05-2026

Max. Marks: 70

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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	What is an IP address?	CO-1	L1
b.	Explain Internet server identities.	CO-1	L2
c.	Which type of Cascading Style Sheet is used within a web page?	CO-2	L1
d.	Describe the use of Images As Hyperlinks in HTML.	CO-3	L2
e.	How does JavaScript support event-driven programming?	CO-4	L1
f.	Give any four advantages of JavaScript.	CO-4	L2
g.	What are radio buttons in HTML forms?	CO-5	L1
h.	Describe Core Language objects with example.	CO-5	L2
i.	Write the tag is used to define the internal link with syntax.	CO-3	L1
j.	Compare text field and password field in forms.	CO-5	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.	CO-1	L3
3.	Explore the various attributes of a table in HTML by providing a suitable example in detail.	CO-2	L4
4.	Interpret the practical use of HTML lists, images, and tables in website development.	CO-2	L5
5.	Explain the structure of the Internet and the various methods through which communication takes place over it, with suitable examples.	CO-1	L5
SECTION-C			
6.	Develop a feedback form using text area and select elements where users can enter comments and select their satisfaction level..	CO-5	L3
7.	Make use of embedded style sheet with appropriate description, syntax and program in HTML.	CO-3	L3
8.	Explain the properties and methods of the Math Object in JavaScript that are used in solving real-world computational problems.	CO-4	L5
9.	Determine the importance of the various form elements available in web pages and their role in effectively capturing and managing user input, with suitable examples.	CO-5	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 09

MCA, Semester- 3rd
SUBJECT NAME: Advanced Computer Networking
Subject Code: PGCA1925

M.Code: 90798

Date of Examination: 14-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Describe the design issues of the network layer.	CO-1	L2
b.	Define frequency division and time division multiplexing.	CO-1	L1
c.	Write the use of CRC lies in safeguarding data by enabling systems to detect inconsistencies.	CO-2	L1
d.	Interpret distance vector routing.	CO-3	L2
e.	Outline two characteristics of IEEE 802.11 standard.	CO-4	L2
f.	List any two MAC protocols used in adhoc networks.	CO-4	L1
g.	Name any two TDMA-based 2.5G standards.	CO-3	L1
h.	Define cell splitting.	CO-4	L1
i.	Explain any five uses of computer networks with examples.	CO-1	L2
j.	Explain Time Division Multiplexing (TDM) with example.	CO-2	L2
SECTION-B			
2.	Compare OSI reference model with TCP/IP model.	CO-1	L4
3.	Simplify various types of transmission impairments in communication systems.	CO-2	L3
4.	Explain layered architecture in computer networks with its advantages.	CO-1	L5
5.	Compare twisted pair, coaxial cable, and optical fiber in a communication system.	CO-2	L5
SECTION-C			
6.	Make use of checksum error detection to detect errors in data transmission.	CO-3	L3
7.	Apply a token bucket algorithm in error detection with an example.	CO-3	L3
8.	Evaluate attenuation, distortion, and noise in an optical fiber with suitable examples.	CO-4	L5
9.	Explain the process and working of the World Wide Web (WWW) .	CO-4	L5

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Total No. of Pages: 01

Date of Examination: 07-05-2026

Max. Marks: 70

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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Why is AI important in real-world problem solving?	CO1	L2
b.	Name an application area of AI.	CO1	L1
c.	Compare A* search and greedy best-first search.	CO2	L2
d.	List two types of grammars used in NLP.	CO2	L1
e.	Explain the concept of supervised learning in machine learning.	CO3	L2
f.	Summarize two recent applications of neural networks.	CO3	L2
g.	Define the significance of knowledge representation in AI.	CO4	L1
h.	Explain fuzzy relations with illustration.	CO4	L2
i.	What is crossover in genetic algorithms?	CO5	L1
j.	Explain the importance of a fitness function in GA.	CO5	L2
SECTION-B			
2.	Apply the concept of intelligence to solve a real-world problem using AI techniques.	CO1	L3
3.	Examine the applications of NLP in real-world AI systems.	CO2	L4
4.	Create a problem formulation for the Water Jug problem using AI techniques.	CO1	L6
5.	Evaluate the effectiveness of the A* search algorithm in solving the shortest path problem.	CO2	L5
SECTION-C			
6.	Explain the real-world applications of soft computing for efficiency.	CO3	L5
7.	Analyze the role of neural networks in solving complex problems and the influence of activation functions on their performance and learning capability.	CO4	L4
8.	Examine the impact of encoding methods and fitness functions on GA performance.	CO5	L4
9.	Determine the effectiveness of multi-level optimization using genetic algorithms and justify its value in solving complex problems.	CO5	L5

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MCA, Semester- 3rd
Software Project Management
Subject Code: PGCA1930
M.Code: 90801

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATES:

- | Q. No. | Question | CO | BL |
|------------------|--|------|----|
| SECTION-A | | | |
| 1. | Answer briefly: | | |
| a. | Define Controlling Quality in project monitoring process. | CO-1 | L1 |
| b. | Describe the Project Team in project management. | CO-1 | L2 |
| c. | What are the Evaluation Techniques in project management? | CO-2 | L1 |
| d. | Illustrate Putnam's Equation in project management. | CO-2 | L2 |
| e. | State the software configuration management. | CO-3 | L1 |
| f. | Write any four advantages of risk evaluation. | CO-3 | L1 |
| g. | Describe the Oldman-Hackman Job Characteristics Model. | CO-4 | L2 |
| h. | Outline the stepwise planning of project execution with an example. | CO-4 | L2 |
| i. | Define the meaning of software reliability. | CO-4 | L1 |
| j. | Compare technical and non- technical risks. | CO-1 | L2 |
| SECTION-B | | | |
| 2. | Point out organizational behavior principles to manage team conflict in projects. | CO-1 | L4 |
| 3. | Judge the effectiveness of Monte Carlo Simulation in project risk assessment. | CO-2 | L3 |
| 4. | Evaluate a project's COCOMO II estimate and explain variances against historical data. | CO-2 | L5 |
| 5. | Justify a project's risk profile using PERT inputs and the impact of identified risk on the project schedule | CO-3 | L5 |
| SECTION-C | | | |
| 6. | Interpret case study of failed project and elaborate the primary reasons for failure. | CO-4 | L5 |
| 7. | Compare Putnam equation with Capers Jones rules of thumb. | CO-4 | L4 |
| 8. | Explain how risks are monitored and controlled during project execution. | CO-3 | L5 |
| 9. | Verify the effectiveness of proposed Work Breakdown Structure & justify it with suitable example. | CO-3 | L5 |

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Total No. of Questions: 09

MCA, Semester- 3rd
THEORY OF COMPUTATION
 Subject Code: PGCA1927
 M. Code: 90800
 Date of Examination: 04-05-2026

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. 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.	Definition of formal language used in theoretical computer science.	CO1	L1
b.	Describe the characteristics of non-computational problems and interpret them using a relevant example.	CO1	L2
c.	Explain the role of minimization in reducing the number of states in a finite automaton.	CO2	L2
d.	Define the role of the dead state in a DFA.	CO2	L1
e.	Illustrate the properties of Context-Free Languages (CFL) and interpret their importance in computational theory.	CO3	L2
f.	Explain the concept of ambiguity in Context-Free Grammar (CFG).	CO3	L1
g.	Classify the mechanism of acceptance by empty stack and its importance in automata theory.	CO4	L2
h.	State the meaning of acceptance by final state in automata theory.	CO4	L1
i.	Define recursive language in the context of formal language theory.	CO5	L1
j.	Interpret the importance of the Chomsky Hierarchy in the classification of formal languages.	CO5	L2
SECTION-B			
2.	Utilize the conversion of a non-deterministic finite automaton (NFA) into a deterministic finite automaton (DFA) with a suitable example.	CO1	L3
3.	Analyze the key differences between Mealy and Moore machines and illustrate them with suitable examples.	CO2	L4
4.	Justify the structure of the Chomsky hierarchy by evaluating each category with relevant examples.	CO3	L5
5.	Evaluate the effectiveness of a Moore and Mealy machine design by constructing it for a suitable example.	CO2	L5
SECTION-C			
6.	Solve ambiguity issues in a given CFG using left factoring or equivalent ambiguity removal strategies.	CO4	L3
7.	Apply the closure properties of Context-Free Languages to solve formal language problems.	CO3	L3
8.	Explain the properties of Turing Machine and Recursive Language in terms of their computational capabilities and limitations.	CO5	L5
9.	Differentiate between solvable and unsolvable problems in context-free languages by analyzing a representative example.	CO5	L4

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MCA, Semester- 4th
ADVANCED WEB TECHNOLOGIES
Subject Code: PGCA 1958

Subject Code: PGCA 1958

M.Code: 91856

Date of Examination: 08-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	What does the abs() function do in PHP?	CO-1	L1
b.	Explain the role of the foreach loop in array processing.	CO-1	L2
c.	What does DOM stand for?	CO-2	L1
d.	Describe the role of web services in web applications.	CO-3	L2
e.	Write any two jQuery UI widgets and state their purpose.	CO-4	L1
f.	Compare XML and HTML.	CO-4	L2
g.	Define Content Management System.	CO-3	L1
h.	Explain the difference between XML elements and XML attributes with a suitable example.	CO-4	L2
i.	List any two methods used to pass data between PHP pages.	CO-1	L1
j.	Describe the steps required to display MySQL data in an HTML table using PHP.	CO-2	L2
SECTION-B			
2.	Build a PHP script that uses numeric functions to perform statistical operations like average, maximum, minimum, and standard deviation.	CO-1	L3
3.	Distinguish between the methods of storing and retrieving user information in MySQL using PHP.	CO-2	L4
4.	Explain the advantages of web services and justify their importance in modern distributed applications.	CO-3	L5
5.	Evaluate the importance of data validation and string manipulation in web application security with the help of supported example.	CO-1	L5
SECTION-C			
6.	Construct an XML document using proper syntax with elements and attributes, and demonstrate how it can be validated using an XML editor.	CO-4	L3
7.	List the components of Bootstrap and their functions in designing responsive web pages in detail.	CO-5	L4
8.	Justify the React Component Life Cycle methods, and recommend their appropriate use in handling events, forms, and dynamic updates in applications.	CO-6	L5
9.	Explain the influence of event handling on dynamic web behaviour in the context of retrieving and manipulating page content in jQuery.	CO-4	L5

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Total No. of Questions: 09

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MCA, Semester- 4TH
IOT & BLOCKCHAIN TECHNOLOGY
Subject Code: PGCA1967
M.Code: 91862

Date of Examination: 12-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define Blockchain and list its primary components.	CO1	L1
b.	Describe a sensor and its role in IoT systems.	CO1	L2
c.	Differentiate between REST and WebSocket APIs.	CO2	L2
d.	Describe how cloud computing supports IoT applications.	CO2	L2
e.	How blockchain can be used to perform cross-border payments.	CO3	L1
f.	Write the significance of nonce in mining.	CO3	L1
g.	Explain how IoT improves efficiency in smart energy systems.	CO4	L2
h.	How is a mortgage implemented using Blockchain?	CO4	L1
i.	Describe the Request-Response communication model.	CO2	L2
j.	How latency affects block propagation.	CO3	L1
SECTION-B			
2.	Examine six primary characteristics of IoT .	CO1	L4
3.	Apply how Cloud Computing and Big Data Analytics integrate into an IoT ecosystem.	CO2	L3
4.	Utilize the concept of IoT applications in retail, agriculture and logistics with suitable examples.	CO4	L3
5.	Compare the working of MQTT, CoAP, TCP, and UDP protocols in IoT communication.	CO2	L5
SECTION-C			
6.	Analyze how blockchain technology ensures transparency and immutability in public ledgers.	CO1	L4
7.	Determine the benefits of blockchain for enterprises, and classify its effectiveness and constraints in practical scenarios.	CO4	L5
8.	Analyze block propagation and Block relay in Bitcoin by examining its key components.	CO3	L4
9.	Explain the advantages, limitations, and challenges of using cryptocurrencies in everyday transactions, highlighting factors hindering their large-scale adoption.	CO3	L5

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Total No. of Questions: 09

Total No. of Pages: 01

MCA, Semester- 4TH
MACHINE LEARNING AND DATA ANALYTICS USING PYTHON
Subject Code: PGCA1976
M.Code: 91855

Date of Examination: 05-05-2026

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. 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	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define Machine Learning in the context of data-driven systems.	CO1	L1
b.	Name categories of Machine Learning paradigms.	CO1	L1
c.	Differentiate simple and multiple linear regression models..	CO2	L2
d.	What is the Naïve Bayes classifier used for supervised classification tasks.	CO2	L1
e.	Explain the need for PCA in machine learning.	CO3	L2
f.	Interpret the meaning of out-of-bag error.	CO3	L2
g.	Classify the role of control structures in program execution flow.	CO4	L2
h.	Identify different built-in data types supported by Python.	CO4	L1
i.	Recall the core idea of reinforcement learning.	CO1	L1
j.	State different benefits of user-defined functions.	CO4	L2
SECTION-B			
2.	Identify any four DataFrame operations for deriving insights from structured data.	CO4	L3
3.	Examine the data labeling requirements in supervised learning systems.	CO1	L4
4.	Apply linear classification techniques for decision boundary formation.	CO2	L3
5.	Interpret the importance of supervised and unsupervised learning approaches.	CO2	L5
SECTION-C			
6.	Classify advanced data handling techniques using Pandas including filtering and transformation.	CO3	L4
7.	Explain the impact of overfitting and underfitting on ML model performance.	CO1	L5
8.	Interpret the merging and joining techniques for data integration tasks.	CO4	L5
9.	Choose two NumPy and Pandas techniques to perform exploratory data analysis on a dataset.	CO3	L3

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