Seat No.	

Set **P**

M.C.A. (Semester - I) (New) (CBCS) Examination: October/November – 2025
Object Oriented Programming using C++ (MCA0101)

Day & Date: Tuesday, 16-12-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Choose the correct statements regarding *inline* function.
   a) It speeds up execution
   b) It slows down execution
   c) It decreases the code size
   d) Both B and C

2) In C++ a constructor is called whenever
   a) an object is declared b) an object is used
   c) a class is declared d) a class is used

3) The fields in a class, of a C++ program are by default _____.
   a) protected b) public
   c) private d) either B or C

4) _____ is pre-defined object in C++ that correspond to the standard output stream.
   a) cin b) cout
   c) iostream.h d) conio.h

5) Which of the following is true about functions?
   i) Functions are used for divide a large code into modules.
   ii) Code reusability is the advantage of functions.
   iii) Functions are much easier to understand, debug and test
   a) Only (i) is true b) Only (i) and (ii) are true
   c) Only (i) and (iii) are true d) All (i), (ii) and (iii) are true

6) The wrapping up of data and function into a single unit (called class) is known as _____.
   a) Data hiding b) Polymorphism
   c) Encapsulation d) File

7) In C++ the unary operator _____ perform the task of allocating the memory.
   a) - b) new
   c) delete d) &

8) The *'this'* pointer is a variable which is used to access the address of the _____ itself.
   a) class b) structure
   c) object d) number

9) Consider the array declaration *"int mark[3];".* The valid indices for this array are _____.
   a) 1,1,1 b) 0,1,2
   c) -1,0,1 d) 0,1,2, 3

10) The process of creating new classes from the existing class is known as _____.
   a) base class b) derived class
   c) inheritance d) base class

B) State True or False **06**

1) Destructors can take arguments but constructors cannot.
2) Library functions are created by programmer according to their requirement.
3) Address of the variable can be accessed using '&' operator.
4) Multiple inheritance is a feature of C++ where a class can inherit from more than one classes.
5) When the file is opened in the write-only mode, the existing contents are deleted and the output pointer is set at the beginning.
6) 'ends' manipulator is used to attach a Null terminating character (\0) at the end of the string.

Q.2 Answer the following short notes. **16**

a) Object and classes
b) Inline function
c) Friend function
d) Destructor

Q.3 Answer the following.

a) What is algorithm? Write the algorithm to find greatest among three numbers **08**
b) Draw a flow chart to find factorial of a number. **08**

Q.4 Answer the following.

a) What is the need of data types in C++? What are the different data types in C++? **08**
b) Explain different looping statements for, while and do-while. **08**

Q.5 Answer the following.

a) Discuss the use of public, private and protected access specifiers and their visibility in the class **08**

b) What is the need of constructor? How it is different from the member function? **08**

Q.6 Answer the following.

a) Write a C++ program to implement function overloading. **08**

b) What are the different manipulators in C++? **08**

Q.7 Answer the following.

a) What is a stream? Discuss the hierarchy stream classes in C++. **08**

b) What is inheritance? Discuss various types of inheritance. **08**

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Set **P**

M.C.A. (Semester - I) (New) (CBCS) Examination: October/November – 2025
Data Structures (MCA0102)

Day & Date: Wednesday, 17-12-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) A parentheses checker program would be best implemented using _____.
   a) Queue b) Stack
   c) Linked List d) Array

2) Quick sort is also known as _____.
   a) Merge sort b) Tree sort
   c) Shell sort d) Partition and exchange sort

3) New nodes are added to the _____ of the queue.
   a) Front b) Rear
   c) Middle d) Both A and B

4) Which of the following is non-liner data structure?
   a) Stacks b) List
   c) Strings d) Trees

5) The term push and pop is related to
   a) Array b) List
   c) Stack d) Tree

6) Which of the following is not the type of queue?
   a) Priority Queue b) Single Ended Queue
   c) Circular Queue d) Simple Queue

7) Which of the following is a Divide and Conquer algorithm?
   a) Bubble Sort b) Selection Sort
   c) Merge Sort d) Heap Sort

8) Process of inserting an element in stack is called _____
   a) Create b) Push
   c) Evaluation d) Pop

9) A linear collection of data elements where the linear node is given by means of pointer is called?
   a) Linked list b) Node list
   c) Primitive list d) Unordered list

10) Which of the following properties are obeyed by all three tree - traversals?
   a) Left subtrees are visited before right subtrees
   b) Right subtrees are visited before left subtrees
   c) Root node is visited before left subtree
   d) Root node is visited before right subtree

B) State True or False **06**

1) To delete a dynamically allocated tree, the best traversal method is post-order traversal.
2) Most appropriate data structure to print a list of elements in reverse order is Queue data structure.
3) When an array is passed to a function, the function receives a copy of the array (call by value)
4) Most appropriate data structure to print a list of elements in reverse order is Queue data structure.
5) In a circular doubly linked list with 10 nodes, we will need to change 4 links if we want to delete a node other than the head node.
6) The largest value in a binary search tree is always stored at the root of the tree.

Q.2 Answer the following. **16**

a) What do you mean by Data Structure?
b) State and explain Front and Rear?
c) What do you mean by Array Indexing?
d) What is Divide and Conquer Sorting?

Q.3 Answer the following. **16**

a) State and show Binary Search Tree of below given series and perform Pre-order, In-order and Post-order traversal of the generated Binary Tree.
Series- 500,85, 100, 7, 400, 235,300, 178,900, 456, 800,200,600,700

b) What is Sorting? Perform and result Selection Sort of given below series-
95,58,43,65,27,41,89,75,13,8

Q.4 Answer the following. **16**

a) State and Explain in detail application of Stack with suitable example?
b) What is Singly Linked List? State the procedure of insertion and deletion of the data item at beginning, middle and end of Circular Linked List with suitable example.

Q.5 Answer the following. **16**

a) What are various applications of Queue? State and explain insertion and deletion operation on Circular Queue with suitable example?

b) Explain Stack Overflow and Underflow conditions with suitable example?

Q.6 Answer the following. **16**

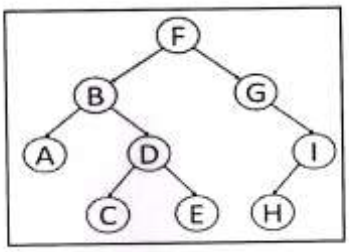
a) State and explain Non-Primitive Data Structures with suitable example?

b) Define Matrix? State and Explain the Sparse Matrix with suitable example?

Q.7 Answer the following. **16**

a) State and differentiate the Single and Multidimensional array with suitable example.

b) Define Binary Tree? Perform and result Pre, In and Post Order traversing of below given Tree?



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Set **P**

M.C.A. (Semester - I) (New) (CBCS) Examination: October/November - 2025
Advanced DBMS (MCA0103)

Day & Date: Thursday, 01-01-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose the correct alternative from the options. **10**

1) SQL stands for _____.
   a) Standard query language
   b) Structured query language
   c) Sequential query language
   d) None

2) The collection of information stored in the database at a particular moment is called _____ of the database.
   a) Instance b) Schema
   c) Subschema d) None

3) _____ Level of abstraction describes how the data are actually stored.
   a) Physical b) Logical
   c) View d) None

4) In relational algebra _____ denotes the project operation.
   a) Π b) ∩
   c) X d) σ

5) ____ Cursor are programmer-defined cursors for gaining more Control over the context area.
   a) View b) Explicit
   c) Implicit d) ERD

6) _____ specify the set of possible values that may be associated with an attribute.
   a) Privilege b) Primary Key
   c) Attribute d) Domain Constraints

7) A transaction is said to be in a _____ state if it executes all its operations successfully.
   a) Log b) Committed
   c) View d) ERD

8) _____ helps in executing the scheduled tasks because they are called automatically.
   a) Cursors b) Joins
   c) Triggers d) ERD

9) _____ is a thing or object in the real world that is distinguishable from other object.
   a) Attributes b) Entity
   c) Relationship d) Association

10) In SQL the _____ statement is used to confer authorization.
   a) Update b) Revoke
   c) Grant d) Select

B) Write True or False **06**

1) A foreign key is an attribute in a table that is a primary key in another table.
2) A cursor is the skeleton structure of the database.
3) The relational database model was created by E.F.Codd.
4) Triggers can operate on insertion, deletion, and updates.
5) An attribute is a characteristic or property of an entity.
6) The primary key does not necessarily have to be unique for a Given table.

Q.2 Answer the following questions. **16**

a) Explain the advantages of DBMS.
b) What are different symbols used in E-R diagram.
c) Explain commands with respect to SQL.
   i) Drop
   ii) Alter
d) What is view? What are the advantages of view?

Q.3 Answer the following questions.

a) What is data abstraction in DBMS? Explain the three levels of data abstraction. **08**
b) Explain DDL, DML, DCL with example. **08**

Q.4 Answer the following questions.

a) What is transaction? Explain the ACID properties. **08**
b) Describe the steps involved in query processing. **08**

Q.5 Answer the following questions.

a) Write short notes on- **08**
   i) Query optimization
   ii) Database administrator
b) Explain the following terms - **08**
   i) Entity ii) Entity set iii) Relation iv) Attributes

Q.6 Answer the following questions.

a)	What is normalization? Explain BCNF with example.	**08**
b)	Explain catastrophic and non-catastrophic failures in brief.	**08**

Q.7 Answer the following questions.

a)	What is database schema? Explain the select, project, natural join, union and cartesian product operations.	**08**
b)	Discuss two types of exceptions in PL/SQL in brief.	**08**

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M.C.A. (Semester - I) (New) (CBCS) Examination: October/November - 2025
Software Engineering (MCA0104)

Day & Date: Friday, 19-12-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which of the items listed below is not one of the software engineering layers?
   a) Process b) Methods
   c) Tools d) Manufacturing

2) What are attributes of good software?
   a) Software functionality
   b) Software maintainability
   c) Software development
   d) Software maintainability & functionality

3) Software engineering is the systematic approach to the_____.
   a) Development of software b) Operation of software
   c) Maintenance of software d) All of the above

4) Boundary value analysis belong to _____.
   a) White Box Testing b) Black Box Testing
   c) Both a) and b) d) None of the above

5) Choose an internal software quality from given below
   a) Scalability b) Usability
   c) Reusability d) Reliability

6) Which of the following does not affect the software quality and organizational performance?
   a) Market b) Product
   c) Technology d) People

7) A generic process framework for software engineering encompasses five activities. What are those activities?
   a) communication, risk management, measurement, production, deployment.
   b) communication, planning, modeling, construction, deployment.
   c) analysis, designing, programming, debugging, maintenance
   d) None of the above

8) _____ is not suitable for accommodating any change?
   a) RAD Model b) Waterfall Model
   c) Build & Fix Model d) Prototyping Model

9) Which one of the following is not a phase of Prototyping Model?
   a) Quick Design b) Coding
   c) Prototype Refinement d) Engineer Product

10) The testing in which code is checked?
   a) Black box testing b) White box testing
   c) Red box testing d) Green box testing

B) Write true/false. **06**

1) A general statement of objectives is the major cause of failed software efforts.
2) Software Debugging is a set of activities that can be planned in advance and conducted systematically.
3) The Incremental Model is a result of combination of elements of Linear Model & Prototyping Model.
4) Beta testing is done at User's end
5) A data object can encapsulates processes and operation as well.
6) SDLC stands for System Design Life cycle.

Q.2 Answer the following. **16**

a) Explain elements of the analysis model.
b) Write a note on data dictionary.
c) What are the causes for software crises?
d) Explain Object-oriented analysis.

Q.3 Answer the following.

a) Explain evolutionary software process model in detail. **08**
b) What is software testing? Explain White box testing. **08**

Q.4 Answer the following.

a) Explain management of object-oriented software projects. **08**
b) Write a note on Interface Design and Procedural Design. **08**

Q.5 Answer the following.

a) Explain data modeling and functional modeling. **08**
b) Explain the software measurement & metrics for software quality. **08**

Q.6 Answer the following.

a) Explain different communication techniques for software requirement analysis. **08**
b) Explain Control Structure testing in detail. **08**

Q.7 Answer the following.

a) Explain the linear sequential model in detail. **08**
b) What is black box testing? Explain the test case parameters with an example. **08**

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M.C.A. (Semester - I) (New) (CBCS) Examination: October/November - 2025
Operating Systems (MCA0105)

Day & Date: Saturday, 20-12-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) The _____ is responsible for resource allocation and de-allocation in a computer system.
   a) Resource supervisor b) Operating system
   c) Allocation Algorithm d) Compiler

2) A _____ interface is a window system with a pointing device to direct I/O, choose from menus, and make selections and a keyboard to enter the text.
   a) Batch b) Fundamental
   c) Window server d) Graphical user

3) The list processes waiting for a particular I/O device is called a _____.
   a) Running queue b) System queue
   c) Device queue d) Waiting queue

4) The _____ buffer length is potentially infinite; thus, any number of messages can wait in it
   a) Unbounded capacity b) Single capacity
   c) Bounded capacity d) Zero capacity

5) The _____ is the module that gives control of the CPU to the process selected by the scheduler and it should be as fast as possible, since it is invoked during every process switch.
   a) Control system b) Dispatcher
   c) I/O Event Wait d) Memory Scheduler

6) _____ are also known as mutex locks.
   a) Counting b) Monitor
   c) Decimal d) Binary

7) A _____ algorithm is designed especially for time sharing systems and in which small unit of time slice is defined.
   a) Time sharing OS b) Round Robin
   c) Shortest Job First d) Priority

8) Path names can be of two types _____ and Relative path.
   a) Absolute path b) Multiple path
   c) Root path d) Single path

9) The _____ is akin to reader lock in that several processes can acquire the lock concurrently and the exclusive lock behaves like writer lock; only one process at a time can acquire such lock.
   a) Hardware Lock b) Shared Lock
   c) System Lock d) Exclusive Lock

10) A major problem with Priority algorithms is _____.
   a) Disk Storage b) Page replacement
   c) Starvation d) First Come First Serve

B) Write True/False. **06**

1) A domain is a collection of access rights, each of which is an ordered pair <object-name, rights-set>.
2) The Distributed System is tightly coupled software on the same loosely coupled hardware.
3) Security violations of the system can be categorized as internal and external fragmentation.
4) A logical memory divided into same sized blocks is called as frame.
5) The ability to execute an operation on an object is an access right.
6) The multiprocessor time sharing systems is tightly coupled software on tightly coupled hardware

Q.2 Answer the following. **16**

a) Critical Section Problem
b) Fragmentation
c) Threads
d) Process Control Block

Q.3 Answer the following.

a) Define System call? Explain various Process State with neat diagram? **08**

b) What is Deadlock? State the various Deadlock characterizations in detail? **08**

Q.4 Answer the following.

a) What are the various CPU Scheduling Criteria? State and explain Shortest Job First algorithm with suitable example? **08**

b) What is File? Explain in detail Shortest Seek Time First method with suitable example? **08**

Q.5 Answer the following.

a) State and explain various types of schedulers with their task of action? **08**

b) What is meant by Demand paging? Explain concept of Page Fault with suitable example? **08**

Q.6 Answer the following.

a) What is Cooperative Process? Explain in detail inter-process communication. **08**

b) Perform Least Recently Used (LRU) Page replacement algorithm on following serial using maximum 03 frames : 0,4,2,3,0,3,2,1,2,0,1,7,0,1,7,0,1,2,0,3 **08**

Q.7 Answer the following.

a) What is Operating System? Explain in detail functions of Operating System. **08**

b) What are the various File operations? State and explain First Come First Serve Disk scheduling method with suitable example. **08**

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M.C.A. (Semester - I) (New) (CBCS) Examination: October/November - 2025
Discrete Mathematical Structures (MCA0109)

Day & Date: Monday, 22-12-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figures to the right indicate full marks

Q.1 Choose the correct alternative: **10**

1) Which of the following statement is incorrect?
   a) $pvq \equiv qvp$ b) $\sim(p \wedge q) \equiv \sim p \wedge \sim q$
   c) $pv(qvr) \equiv (pvq)vr$ d) None of these

2) In lattice $L, a \leq b \forall a, b \in L$ iff _____.
   a) $a \wedge b = a$ b) $a \vee b = b$
   c) Both a & b d) $a \wedge b = \emptyset$

3) The function $f: R \rightarrow R \; such \; that \; f(x) - 0 \forall x \in R$ is called _____.
   a) One-one function b) Zero function
   c) Identity function d) None of these

4) The value of $P(9,5)$ is _____.
   a) 15200 b) 15100
   c) 15201 d) 15120

5) If $A = \{a, b\}$ and $B = [1,2,3]$ then $|P(A \; x \; B)|$ = _____.
   a) 4 b) 8
   c) 64 d) 32

6) If there are multiple edges and there is no loop between any pair of vertices then the graph is called a _____.
   a) Pseudo graph b) Multi graph
   c) Simple graph d) Regular graph

7) In how many ways can three people take up their seats in a five-seater car?
   a) 60 b) 15
   c) 8 d) 30

8) Equivalent form of $p \; v \sim p$ is _____.
   a) F b) T
   c) P d) $\sim p$

9) If $A = \begin{bmatrix} 6 & 1 & 4 \\ -1 & 5 & 2 \\ 3 & 0 & -1 \end{bmatrix}$ then the trace of A is _____.

a) 11 b) 7
c) 5 d) 10

10) In set theory, if U is the universal set then $\emptyset^c$ = _____.

a) $\emptyset$ b) U
c) $\{\emptyset\}$ d) A

B) Fill in the blanks: **06**

1) If A and B are two matrices then $(AB)^T =$ _____.
2) If S is poset, then S is said to be totally ordered if every two elements of S are _____.
3) The contra-positive of $p \rightarrow q$ is _____.
4) A graph which contains loops and parallel edges is called _____ graph.
5) The necessary and sufficient condition for a square matrix A to be invertible is that A is _____.
6) Number of ways of selecting a class representative in a class having12 boys and 13 girls is _____.

Q.2 Answer the following. **16**

a) If $P(n, 2) = 72$, find the value of n.

b) Find the adjoint of the matrix $A = \begin{bmatrix} 4 & 5 & 6 \\ 2 & -1 & 3 \\ -3 & 2 & 1 \end{bmatrix}$

c) Define Abelian group.

d) Construct truth table for the given statement pattern: $p \rightarrow [\sim(q \wedge r)]$

Q.3 Answer the following. **16**

a) If A and B are two sets then show that:
i) $(A \cup B)^c = A^c \cap B^c$ ii) $(A \cap B)^c = A^c \cup B^c$

b) Define Tautology. Also using truth table, prove that the given statement pattern is a Tautology: $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow (p \rightarrow r)$

Q.4 Answer the following. **16**

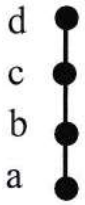
a) Without using truth table prove the following logical equivalence:
i) $p \leftrightarrow q \equiv (p \wedge q) V (\sim p \wedge \sim q)$
ii) $[\sim p \wedge (p \vee q)] \rightarrow q \equiv T$

b) Write a short note on Bipartite graph with an example.

Q.5 Answer the following. **16**

a) Prove that the fourth roots of unity 1, -1, i, -i forms an Abelian multiplicative group.

b) Determine whether the poset represented by the following Hasse diagram is a Lattice or not.



Q.6 Answer the following. **16**

a) If $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$ $and\ B = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$, then find AB and BA.

Also verify that $AB \neq BA$

b) Write short notes on:

i) Quantifiers and Quantified statements.

ii) Composition of functions.

Q.7 Answer the following. **16**

a) Solve the given system of linear equations by matrix method:
$x + 2y + 3z = 4, x + 4y + 9z = 6, x + y + z = 3$

b) If R be a relation on the set of integers Z defined by:
$R = \{(x, y) : x \in Z, y \in Z, (x - y) is\ divisible\ by\ 6\}$
Then prove that R is an equivalence relation.

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M.C.A. (Semester - II) (New) (CBCS) Examination: October/November - 2025
Java Programming (MCA01201)

Day & Date: Tuesday, 28-10-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which class is used to create mutable strings in Java?
   a) String b) StringBuffer
   c) MutableString d) StringBuilder

2) Arrays in Java are _____.
   a) Primitive data types b) Fixed-size objects
   c) Dynamically resized d) None of the above

3) Which interface must be implemented to create a thread?
   a) Thread b) Runnable
   c) EventListener d) Threadable

4) Which keyword is used to inherit a class in Java?
   a) implement b) super
   c) extends d) inherits

5) Which AWT control is used to create a drop-down list?
   a) Button b) List
   c) Choice d) Text Field

6) Wrapper classes are used to _____.
   a) Wrap primitive types into objects
   b) Handle exceptions
   c) Create interfaces
   d) Synchronize threads

7) The method used to pause a thread for a specific time _____
   a) wait() b) notify()
   c) sleep() d) stop()

8) Which block is always executed in exception handling?
   a) try b) catch
   c) finally d) throw

9) Which is the correct way to declare an array in Java?
   a) int arr[]; b) array int arr;
   c) int arr; d) int array[];

10) Which of these cannot be used to create an abstract class in Java?
   a) abstract keyword b) final keyword
   c) both a and b d) None of these

B) State True or False. **06**

1) Java threads can be created by extending the Thread class or implementing the Runnable interface.
2) You can create a user-defined exception by extending the Throwable class.
3) The return statement can only be used inside methods that return a value.
4) The super keyword is used to call the constructor or method of the superclass.
5) Wrapper classes allow primitive data types to be used in collections like ArrayList.
6) In Java, synchronization helps avoid thread interference and memory consistency errors.

Q.2 Answer the following short notes. **16**

a) Super Keywords
b) Access Protection
c) Wrapper Classes
d) Abstract Class

Q.3 Answer the following.

a) Differentiate between the Thread class and Runnable interface. **08**
b) What is a Constructor? Explain types of Constructors in Java. **08**

Q.4 Answer the following.

a) What is exception Handling? Explain Try-Catch and finally blocks with example. **08**
b) What is multithreading? Explain the Java thread model. **08**

Q.5 Answer the following.

a) Explain Java's Event Delegation Model. How are event sources, listeners, and events related? Provide a diagram. **08**
b) What are predefined I/O streams in Java? Explain the use of System.in, System.out, and System.err. **08**

Q.6 Answer the following.

a) Explain the difference between String and StringBuffer classes with suitable examples. **08**
b) What are the different AWT controls available in Java? Explain with syntax. **08**

Q.7 Answer the following.

a)	What is JDBC? Explain all JDBC Drivers in java.	**08**
b)	What are wrapper classes in Java? Explain their use and provide and examples of autoboxing and unboxing.	**08**

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M.C.A. (Semester - II) (New) (CBCS) Examination: October/November – 2025
Python Programming (MCA01202)

Day & Date: Thursday, 30-10-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) What error occurs when you execute the following Python code snippet?

```
apple = mango.
```

a) SyntaxError b) NameError
c) ValueError d) TypeError

2) Which of the following statements create a dictionary?
a) dic = {} b) dic = {“amar”:50, “ajay”:45}
c) d = {50:”amar”, 55:”ajay”} d) All of the mentioned

3) Which module is required to support regular expression?
a) regular b) re
c) regex d) pyregular

4) Following set of commands are executed in shell, what will be the output?

```
>>>str = ‘hello’
>>>str [:2]
```

a) he b) lo
c) Olleh d) hello

5) What will be the output of the following code?

```
X = ['python','programming']
for i in X:
    i.upper()
    print(X)
```

a) PYTHON PROGRAMMING
b) ['python', 'programming']
c) [PYTHON PROGRAMMING]
d) [python programming]

6) What will be the output of the following Python code?

```
>>>a=(1,2,3)
>>>a+a
```

a) (1, 2, 3 1, 2, 3) b) (2, 4, 6)
c) (1, 1, 2, 2, 3, 3) d) [1, 1, 2, 2, 3, 3]

7) Which of the following methods adds an element at the end of a list?
a) insert() b) append()
c) extend() d) add()

8) What does the 'get()' method do in dictionary?
a) Deletes a key
b) Returns value for a given key
c) Adds a new key-value pair
d) Sorts the dictionary

9) What is a tuple in Python?
a) A mutable list b) A stack
c) An immutable sequence d) A set of key-value pairs

10) What is a set in Python?
a) A collection of ordered, duplicate items
b) A collection of unordered, unique items
c) A collection of key-value pairs
d) A fixed-length sequence

B) State whether true or false. **06**

1) Python uses { } curly braces to define code blocks.
2) You can define a function in Python using the def keyword.
3) The range (5) function returns the numbers 0 through 5.
4) The input () function always returns data as an integer.
5) A Python ‘list’ can contain elements of different data types.
6) Python provides a built-in threading module to work with threads.

Q.2 Write short notes on. **16**

a) Difference between list and tuple.
b) Decorators.
c) Features of Python.
d) Thread in python.

Q.3 Answer the following. **16**

a) Explain the concept of sets in Python. What are their characteristics and how do they differ from lists and tuples?
b) Write a Python program that demonstrates set operations like union, intersection, and difference using two sets of student names.

Q.4 Answer the following. **16**

a) What is Tuple? How to access values in a tuple? Explain basic tuple operations.

b) How do you create, access, and modify a dictionary in Python? Provide examples.

Q.5 Answer the following. **16**

a) What is a module in Python? Explain the different types of modules available in Python. How do you import a module in Python? Explain the different ways of importing modules.

b) What is inheritance in Python? Explain different types of inheritance with examples.

Q.6 Answer the following. **16**

a) Explain method overloading and method overriding in Python. How are they implemented?

b) Write a program to find the factorial of a number using a loop.

Q.7 Answer the following. **16**

a) What is Data Science? Write some applications of data science. What are the steps in the life cycle of data science?

b) What is NumPy? What are the different attributes of array in NumPy? What are the various functions available in NumPy for filling arrays with specific values?

Seat No.	

Set **P**

M.C.A. (Semester - II) (New) (CBCS) Examination: October/November - 2025
Computer Communication Network (MCA01203)

Day & Date: Saturday, 01-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. (MCQ) **10**

1) What of the following device is used in the network layer?
   a) Application gateway b) Switch
   c) Router d) Repeaters

2) Which protocol is primarily used for secure web browsing?
   a) FTP b) HTTP
   c) HTTPS d) SMTP

3) What is the main function of a router in a network?
   a) To filter network traffic
   b) To forward data packets between computer networks
   c) To manage IP addresses
   d) To encrypt data

4) Which of the following is a Layer 2 protocol?
   a) IP b) TCP
   c) Ethernet d) UDP

5) In the OSI model, which layer is responsible for end-to-end communication?
   a) Physical layer b) Data link layer
   c) Transport layer d) Application layer

6) Which of the following techniques is used to prevent data collisions in a network?
   a) DNS b) CSMA/CD
   c) IP addressing d) Subnetting

7) In which of the following switching methods, the message is divided into small packets?
   a) Message switching b) Packet switching
   c) Virtual switching d) None of the these

8) Which of the following servers allows LAN users to share data?
   a) Data server b) Point server
   c) File server d) Communication server

9) Which of the following protocols is the bit-oriented protocol?
   a) SSL b) http
   c) HDDLC d) All of the these

10) What is the size of the sender window in the Go Back N (ARQ) protocol?
   a) 0 b) 1
   c) 10 d) N

B) State True or False. **06**

1) CRC stands for code redundancy check.
2) DHCP protocol is used to transport all information between Web servers and clients.
3) The network layer concerns with packets.
4) The Network layer is concerned with the controlling of operation of the subnet.
5) IMAP4 servers require less storage space and usually more processing resources than POP servers do.
6) HTTP protocol primarily used for browsing data.

Q.2 Write short notes. **16**

a) WAN.
b) Applications of Computer Network.
c) DNS.
d) IP Address.

Q.3 Answer the following.

a) What is routing? Explain shortest path routing algorithm. **08**
b) Explain error detecting code by data link layer. **08**

Q.4 Answer the following.

a) State and explain IPv4 header format. **08**
b) Describe Wide Area Network (WAN) and its components. **08**

Q.5 Answer the following.

a) Explain the data link layer protocol using Go Back N. **08**
b) What are the functions of transport layer? **08**

Q.6 Answer the following.

a) What is congestion? Explain congestion control in virtual circuit subnet. **08**
b) What is sliding windows protocol? Explain one-bit sliding windows protocol. **08**

Q.7 Answer the following.

a)	What is TCP? Explain TCP segment header structure in detail.	**08**
b)	Explain HTTP (Hyper Text Transfer Protocol) in detail.	**08**

Seat No.	

Set | P

M.C.A. (Semester - II) (New) (CBCS) Examination: October/November - 2025
System Software (MCA01204)

Day & Date: Tuesday, 04-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figures to right indicate full marks.

Q.1 A) Choose correct alternatives: **10**

1) Which of the following is a stage of compiler design?
   a) Semantic analysis
   b) Intermediate code generator
   c) Code generator
   d) All of the mentioned

2) Which of the following is not a type of assembler?
   a) one pass b) two passes
   c) three passes d) load and go

3) _____ converts the programs written in assembly language into machine instructions.
   a) Machine compiler b) Interpreter
   c) Assembler d) Converter

4) The dynamic linking postpones function until _____ time.
   a) Load b) Execution
   c) Compile d) None of these

5) Which of the following is the primary function of a linker?
   a) Translating high-level code into machine code.
   b) Combining multiple object files into a single executable.
   c) Managing memory allocation for running programs.
   d) Loading programs into memory for execution.

6) The Sun Micro Systems processors usually follow_____architecture.
   a) CISC b) ISA
   c) ULTRA SPARC d) RISC

7) A bootstrap loader is responsible for_____.
   a) Loading the operating system kernel
   b) Linking multiple object files
   c) Optimizing program code
   d) Managing memory allocation

8) Each program in the_____ software is called a system program.
   a) System b) Application
   c) Hardware d) Program

9) The beginning of the macro can be represented as_____.
   a) START b) BEGIN
   c) MACRO d) None of the mentioned

10) What type of parser does YACC generate?
   a) SLR parser b) LALR parser
   c) LR parser d) LL parser

B) Write True or False **06**

1) Assembler is used as a translator for high level language.
2) The RISC processor has a more complicated design than CISC.
3) A multipass assembler scans the assembly language program multiple times to resolve symbols.
4) Compilers only check for syntax errors in the code.
5) CISC architecture is power efficient.
6) RISC processors typically have simpler instruction decoding than CISC processors.

Q.2 Write short notes on. **16**

a) MS-DOS Linker.
b) Macro processor functions.
c) Dynamic linking.
d) YACC Compiler.

Q.3 Answer the following **16**

a) What is Loader? Explain in detail various features of machine independent loader.
b) Define Assembler. State and differentiate between one pass and multi pass assemblers.

Q.4 Answer the following **16**

a) Explain machine-independent features of macro processor.
b) What is Compiler? Explain in detail the basic functions of the compiler.

Q.5 Answer the following **16**

a) What is Bootstrap Loader? Explain in detail design of Absolute Loader and related functions.
b) Differentiate between linkers and loaders.

Q.6 Answer the following. **16**

a) What is Linker? Explain MS-DOS and SunOS linkers.
b) Explain machine-dependent and machine-independent compiler features.

Q.7 Answer the following. **16**

a) What is System Softwate? Explain in detail SIC standard model machine architecture with most commonly encountered hardware features.

b) Explain macro processor and basic design options.

SLR-GI-12

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M.C.A. (Semester - II) (New) (CBCS) Examination: October/November – 2025
UML (MCA01207)

Day & Date: Friday, 07-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternatives. **10**

1) UML is primarily used for: ____.
   a) Coding in Java
   b) Draw DFD
   c) Modeling software systems
   d) Draw Flow Chart

2) Which diagram is used to model the dynamic behavior of a system?
   a) Class Diagram b) Use Case Diagram
   c) Sequence Diagram d) Deployment Diagram

3) Which of the following relationships represents "part-of" in UML?
   a) Generalization b) Association
   c) Aggregation d) Composition

4) In a Use Case Diagram, the actors are:
   a) Internal system components
   b) Users or external systems interacting with the system
   c) Use cases
   d) Classes

5) What does a class diagram primarily describe?
   a) The behavior of the system
   b) The interactions between users
   c) The static structure of the system
   d) The deployment of the system

6) What does a solid line with a hollow triangle between two classes represent?
   a) Aggregation
   b) Composition
   c) Generalization (Inheritance)
   d) Association

7) What is the visibility of a member if it is marked with + in a class diagram?
   a) Protected b) Public
   b) Private d) Package

8) A dependency relationship in UML is shown by: ____.
   a) Solid line
   b) Dashed line with an open arrow
   c) Solid line with a diamond
   d) Line with a triangle

9) In a use case diagram, actors represent: ____.
   a) Users or other systems that interact with the system
   b) The internal processes
   c) The database tables
   d) System components

10) In a sequence diagram, a vertical dashed line under an object is called: ___.
   a) Activation bar b) Lifeline
   c) Sequence line d) Interaction flow

B) State whether true or false **06**

1) In an activity diagram, diamond symbol is used to represent a decision or branch.
2) In a deployment diagram, a node represents a physical computing resource (e.g., server, device).
3) UML is used for visualizing, specifying, constructing, and documenting software systems.
4) UML supports **only** forward engineering.
5) A Package Diagram is used to group related elements.
6) An Activity Diagram can have multiple start points.

Q.2 Write short notes on **16**

a) Concept of "Dependency" in UML.
b) State machine.
c) Events and signals.
d) Exporting of packages.

Q.3 Answer the following. **08**

a) What is relationship in UML? Explain different kinds of different relationship in UML.
b) Describe the architecture of software intensive system.

Q.4 Answer the following. **08**

a) Describe the sequence diagram in UML.
b) What is a component diagram in UML?

Q.5 Answer the following. **16**

a) Explain activity diagram. Describe the following terms
i) Swimlane, ii) Forking and joining

b) Explain the difference between activity diagrams and state machine diagrams in UML.

Q.6 Answer the following. **16**

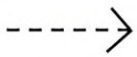
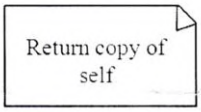
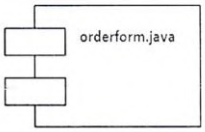
a) Explain the purpose of interaction diagrams in UML.

b) Discuss the concept of generalization in UML.

Q.7 Answer the following. **16**

a) What is adornment in UML? What are the four adornments that can be applied to association?

b) Write the use of following notations.

No.	Noatation	No.	Noatation
1		3	
2		4	

Seat No.	

Set | P

M.C.A. (Semester - II) (New) (CBCS) Examination: October/November – 2025
Office Automation (MCA01209)

Day & Date: Monday, 10-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternatives. **10**

1) First Generation of computer was based on which technology?
   a) Transistors b) LSI
   c) VLSI d) Vacuum Tube

2) Which bar is usually located below the title bar that provides categorized options?
   a) Status Bar b) Menu Bar
   c) Tool Bar d) Scroll Bar

3) Which of the following is not a font style?
   a) Bold b) Italic
   c) Regular d) Superscript

4) In MS-Word, the mailing list is known as the ____.
   a) Data Souce b) Sheet
   c) Datasheet d) Source

5) Which short cut key inserts a new slide in current presentation?
   a) Ctrl+N b) Ctrl+M
   c) Ctrl+S d) All of above

6) A_____ is a major database object used to display information in a printable page format.
   a) Form b) Query
   c) Report d) Table

7) The effect applied to display when slides changes in slide show view Is_____
   a) Slide Animation b) Custom Animation
   b) Custom Transition d) Slide Transition

8) What is the function of Ctrl + B in MS-Word.
   a) It converts selected text into the next larger size of the same font
   b) It adds a line break to the document
   c) It makes the selected text bold
   d) It applies italic formatting t the selected text

9) PowerPoint is saved as_____
   a) .pptx b) .xlsx
   c) .txt d) .docx

10) What is Dialog Box?
   a) A permanent window that always stays open
   b) A temporary window that appears when the program needs user input
   c) A type of operating system
   d) A file format

B) Write true/false **06**

1) Microsoft Word is an example of an office automation tool.
2) Macros in Excel can automate repetitive tasks.
3) A formula in Excel always begins with the symbol @.
4) Forms in Access are used to print reports.
5) PowerPoint does not allow inserting audio or video files.
6) In MS-Word Ctrl + V is used to cut the selected text.

Q.2 Write the following questions. **16**

a) Write the shortcut key to perform the following task in a MS-word Processing software:
   a) To save a Document.
   b) To close the Document.
   c) create a new Document.
   d) To print a Document.

b) Write a note on Control Panel.

c) What is the difference between a dialog box and a window?

d) Define Computer. Explain advantages of computer.

Q.3 Answer the following questions

a) What is Mail Merge? Write the steps to create mail merge in MS-Word. **08**

b) Explain Block diagram of computer. **08**

Q.4 Answer the following questions

a) What is table? How can you add more rows or columns to a table after creating it? Discuss the different table layouts. **08**

b) Write a short note on Animation and slide Transition. **08**

Q.5 Answer the following questions.

a) Explain any four desktop icons. **08**

b) Describe the steps to create a database in MS Access. **08**

Q.6 Answer the following.

a) Explain the features and advantages of MS Word. **08**

b) Explain the terms a) Macros b) Pivot Table **08**

Q.7 Answer the following questions.

a) Explain the hardware and software of a computer. **08**

b) What is Conditional formatting? And how do you apply it? **08**

Seat No.	

Set **P**

M.C.A. (Semester - III) (New) (CBCS) Examination: October/November - 2025
.NET Technology (MCA01301)

Day & Date: Wednesday, 29-10-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) Multiple choice questions. **10**

1) Which is the correct basic syntax of Application directive?
   a) <%@ Application Language="C#" %>
   b) <!-- Application Language="C#"-->
   c) <%@ Application_DIR Language="C#" %>
   d) <%@ DIR @Application Language="C#" %>

2) Which protocol is used to call a web service?
   a) SOAP Protocol b) HTTP Protocol
   c) TCP Protocol d) FTP Protocol

3) Which of the following tag is used for the HTML checkbox?
   a) <check> b) <checkbox>
   c) <input> d) None of these

4) Which of the following property is used to set tab order for ASP.NET RadioButton control?
   a) Tab Order b) Tab Index
   c) Index d) Tab

5) What is ToolTip?
   a) It is an application event b) It is a method
   c) It is a property d) None of these

6) We can manage states in asp.net application using
   a) Session Objects b) Application Objects
   c) View state d) All of these

7) _____ is a code that consists of CPU and platform-independent set of instructions, which can be easily converted to native code.
   a) JIT b) FCL
   c) MSIL d) DLL

8) _____ ensures complete interoperability among applications, regardless of the language used to create the application.
   a) FCL b) CLR
   c) CLS d) CTS

9) What is the base class from which all Web forms inherit?
   a) Master Page b) Session Class
   c) Page Class d) None of these

10) Which of the following languages may be used to write server side scripting in ASP.NET?
   a) C# b) VB
   b) Both a and b d) C++

B) Write True/False. **06**

1) Label display static text that can change at runtime.
2) Init is the first event triggered when a user requests an ASP.NET page.
3) SessionlDs are stored in cookies by ASP.Net.
4) 'TCP' protocol is used to call a web service.
5) 'PreLoad' is not a page event in ASP.Net.
6) ASP.Net is the server-side OOP language.

Q.2 Answer the following questions. **16**

a) Write short note on Global.asax.
b) Write a short note on HTTP handler.
c) Write a short note on JIT.
d) Explain CLS and CTS.

Q.3 Answer the following questions.

a) What is Master page? Explain master page events. **08**
b) What are ASP.NET Directives? Explain Page Directive. **08**

Q.4 Answer the following questions.

a) Explain the components of visual studio IDE. **08**
b) Explain ASP.NET Page life cycle. **08**

Q.5 Answer the following questions.

a) Write difference between ASP and ASP.NET. **08**
b) Explain difference between server side validation and client side validation. **08**

Q.6 Answer the following questions.

a) Explain ASP.NET server controls in brief. **08**
b) Explain creation of master page and content page with example. **08**

Q.7 Answer the following

a)	Explain features of C#.	**08**
b)	Explain different control statements.	**08**

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M.C.A. (Semester - III) (New) (CBCS) Examination: October/November - 2025
Digital Image Processing (MCA01302)

Day & Date: Friday, 31-10-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question No.1 and 2 are compulsory.
2) Attempt any 3 questions from Q.No.3 to Q.No.7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives **10**

1) Which of the following is the first step in digital image processing?
   a) Image enhancement b) Image acquisition
   c) Image segmentation d) Image restoration

2) What is a digital image?
   a) An image in analog form
   b) A 2D function represented in discrete values
   c) A sound wave
   d) A 3D object

3) The process of partitioning an image into meaning fill regions is known as: _____
   a) Compression b) Segmentation
   c) Enhancement d) Restoration

4) Which type of noise appears as white and black dots in an image?
   a) Gaussian noise b) Salt-and-pepper noise
   c) Uniform noise d) Speckle noise

5) What is the result of applying erosion followed by dilation?
   a) Dilation b) Closing
   c) Opening d) Noise removal

6) What effect does erosion have on binary images?
   a) Thickens object boundaries
   b) Removes background noise
   c) Shrinks the object size
   d) Fills holes in the object

7) Which of the following segmentation methods is based on pixel intensity thresholding?
   a) Region growing b) Watershed
   c) Edge detection d) Thresholding

8) Which method segments an image by grouping neighboring pixels with similar properties?
   a) Thresholding b) Region growing
   c) Morphological gradient d) Histogram equalization

9) What is spatial domain image enhancement?
   a) Modification of the image in the frequency domain
   b) Modification of pixel values directly
   c) Use of wavelet transforms
   d) Compression of image data

10) Which filter uses the second derivative for edge enhancement?
   a) Sobel filter b) Laplacian filter
   c) Median filter d) Average filter

B) State whether true or false. **06**

1) Opening is erosion followed by dilation.
2) Erosion removes small objects or shrinks object boundaries.
3) Image restoration aims to recover the original image from a degraded one.
4) Median filters are effective in removing salt-and-pepper noise.
5) A color image in RGB format has only one channel.
6) The histogram of an image shows the frequency of each gray level.

Q.2 Answer the following. **16**

a) Write a short note on digital image representation.
b) Write a short note on image negative transformation.
c) Explain opening and closing operations.
d) Write a short note on image segmentation and its purpose.

Q.3 Answer the following. **16**

a) Explain the fundamental steps in a digital image processing system.
b) Explain pixel relationships 4-neighbors, 8-neighbors, connectivity and adjacency, in digital images.

Q.4 Answer the following. **16**

a) What is image enhancement? Explain spatial domain techniques.
b) Describe smoothing spatial filters with examples.

Q.5 Answer the following. **16**

a) Define image restoration and explain its objective. Explain image degradation model.
b) Explain noise models used in image restoration.

Q.6 Answer the following. **16**

a) Define image morphology and its importance. Explain erosion and dilation operations.

b) Define image segmentation and its purpose. Explain threshold-based segmentation.

Q.7 Answer the following. **16**

a) Explain Boundary descriptors in detail with a neat diagram.

b) Explain thinning and thickening operations.

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Set **P**

M.C.A. (Semester - III) (New) (CBCS) Examination: October/November – 2025
Mobile Computing (MCA01303)

Day & Date: Monday, 03-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternatives. **10**

1) The hexagon shape is used for radio coverage because
   a) It uses the maximum area for coverage
   b) Fewer number of cells are required
   c) It approximates a circular radiation pattern
   d) All of the above

2) Radio capacity may be increased in cellular by_____
   a) Increase in the radio spectrum
   b) Increasing the number of base stations & reusing the channels
   c) None of the above
   d) Both a & b

3) The term TDM stands for
   a) Time Division Multiplexing
   b) Transfer Multiplexing
   c) Tedious Division Multiplexing
   d) None of the above

4) In which one of the following, the slow and fast hopping is used?
   a) GSM b) GPRS
   c) FHSS d) None of the above

5) In a Cellular network, which of the following is used to use the same frequency for others?
   a) Frequency hopping b) Frequency reuse
   c) Frequency planning d) None of the above

6) In the Cellular Network, on which of the following, the cell's shape depends?
   a) Political conditions b) Social Conditions
   c) Environment Condition d) None of the above

7) Which of the following offers packet mode data transfer service over the cellular network?
   a) TCP
   b) GSM
   b) GPRS
   d) None of the above

8) Which of the following is not an example of wireless communication?
   a) Wi-Fi
   b) Mobiles
   c) Landline
   d) Wireless Computer Parts

9) Which of the following specifies a set of media access control (MAC) and physical layer specifications for implementing WLANs?
   a) IEEE 802.11
   c) IEEE 802.15
   b) IEEE 802.16
   d) IEEE 802.3

10) Virtual machine optimized for Android is_____
   a) Java Virtual Machine
   b) Dalvik Virtual Machine
   c) Java Application Framework
   d) None

B) Fill in the blanks **06**

1) An interconnected collection of piconet is called _____.
2) PSTN stands for_____.
3) The shape of the cell in cellular system is _____ shaped.
4) IEEE_____ standard defines the services that need to be provided by the Wireless LAN.
5) _____ compiler converts java byte code into Dalvik Byte code.
6) _____ is a packet oriented mobile data service available to users.

Q.2 Answer the following. **16**

a) Explain the types of antennas in wireless transmission.
b) Write about the Hidden and exposed terminals.
c) Explain the Encryption mechanism used in GSM System.
d) List out the different types of android applications.

Q.3 Answer the following.

a) Explain the protocol architecture of the GSM System. **08**
b) Explain TDMA with an example. **08**

Q.4 Answer the question.

a) Explain the mechanism of FHSS. **08**
b) Explain the Mobile Originated Call (MOC) with its flow. **08**

Q.5 Answer the questions.

a) Explain Agent Advertisement in the IP packet delivery agent discovery. **08**

b) Explain is congestion control mechanism in mobile transport layer? **08**

Q.6 Answer the following.

a) Explain the Protocol architecture of an IEEE 802.11 **08**

b) What is Handover? Explain inter MSC handover in detail. **08**

Q.7 Answer the following questions.

a) Explain Android Activity Life cycle. **08**

b) Explain the Text View and Button UI Interface components of Android. **08**

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M.C.A. (Semester - III) (New) (CBCS) Examination: October/November - 2025
Artificial Intelligence (MCA01304)

Day & Date: Thursday, 06-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt Any Three questions from Q. No. 3 to Q. No. 7
3) Figures to right indicate full marks.

Q.1 A) Choose the correct alternatives from the given options. 10

1) What type of knowledge is represented by facts and rules?
   a) Procedural knowledge b) Declarative knowledge
   c) Experiental knowledge d) Implicit knowledge

2) Which of the following is an example of AI in everyday life?
   a) Printed Books
   b) Non-digital Clocks
   c) Standard calculators
   d) Voice assistants Like Siri or Alexa

3) What is the Turing Test used for?
   a) To test the speed of a Computer
   b) To Assess a machine's ability to exhibit intelligent behavior equivalent to a human
   c) To evaluate the efficiency of algorithms
   d) To check the hardware performance

4) In a semantic network, nodes typically represent: ____.
   a) Classes or concepts. b) Physical objects only.
   c) Mathematical equations. d) Actions and conditions.

5) _____ is the primary purpose of knowledge representation in AI.
   a) To enhance computational speed
   b) To store data efficiency
   c) To enable machines to understand and manipulate information
   d) To improve user interface design

6) Which of the following is true about fuzzy logic?
   a) Fuzzy logic deals with crisp, binary true/false values.
   b) Fuzzy logic operates by associating a degree of truth between 0 and 1 to concepts.
   c) Fuzzy logic only works in Boolean algebra.
   d) Fuzzy logic eliminates the need for probability calculations.

7) In Bayesian Networks, the nodes represent: ____.
   a) Probabilities of different outcomes.
   b) Logical rules or conditions.
   c) Variables and their conditional dependencies.
   d) Possible actions or outcomes in decision-making.

8) One of the main challenges in knowledge acquisition for expert systems is: ____.
   a) Ensuring that the system can interpret vague or ambiguous inputs.
   b) Gathering relevant data in real-time.
   c) Getting domain experts to articulate their knowledge in a way that can be formalized.
   d) Designing the user interface of the system.

9) Syntactic processing in NLP involves: ____.
   a) Determining the meaning of words and sentences in context.
   b) Identifying the correct syntax or structure of sentences.
   c) Resolving ambiguities in word meanings.
   d) Understanding the emotional tone behind a sentence.

10) Alpha-Beta pruning is used to: ____.
   a) Ensure that both players in a game have equal chances of winning.
   b) Cut branches in the search tree that do not need to be explored.
   c) Change the decision-making criteria at each node.
   d) Improve the accuracy of evaluating moves in complex games.

B) State True or False. **06**

1) In predicate logic, functions cannot be used to represent relationships between entities.
2) Backward reasoning starts with the goal and works backward to identify the required conditions.
3) Al is concerned with creating systems that can mimic human intelligence.
4) Hill Climbing is an uninformed search strategy that always guarantees the optimal solution.
5) Syntactic processing in NLP involves analyzing the grammatical structure of sentences.
6) Alpha-Beta pruning always guarantees finding the optimal solution, regardless of the heuristic used in the game.

Q.2 Write the following questions. **16**

a) Forward reasoning.
b) Procedural Knowledge.
c) Expert System Shells.
d) Knowledge Acquisition.

Q.3 Answer the following questions.

a) Explain Bayes' Theorem and its application in probabilistic reasoning. **08**

b) What are Semantic Networks, and how are they used in knowledge representation? **08**

Q.4 Answer the questions.

a) Explain difference between Procedural and Declarative Knowledge. **08**

b) What is Production System and Explain Characteristics of Production System. **08**

Q.5 Answer the questions.

a) Explain difference between Forward and Backward Reasoning? **08**

b) Explain Constraint Satisfaction and write its Algorithm? **08**

Q.6 Answer the following.

a) What are Certainty Factors (CFs) in rule-based systems, and how do they enhance the functioning of such systems? **08**

b) Explain the concept of expert system shells. **08**

Q.7 Answer the following questions.

a) Describe Bayesian Networks and explain their application in decision-making. **08**

b) How do frames help represent structured knowledge about objects or concepts? **08**

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M.C.A. (Semester - III) (New) (CBCS) Examination: October/November - 2025
Data Mining and Warehouse (MCA01307)

Day & Date: Saturday, 08-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figures to the right indicate full marks

Q.1 Choose the correct alternative: **10**

1) _____ is a subject-oriented, integrated, time-variant, non-volatile collection of data in Support of management decisions.
   a) Data Mining b) Text Mining
   c) Web Mining d) Data Warehouse

2) The star schema is composed of _____ fact tables.
   a) one b) Two
   c) three d) four

3) A sequence of patterns that occur frequently is known as?
   a) Frequent Subsequence b) Frequent Item Set
   c) Frequent Sub Structure d) All of these

4) _____ is defined as the difference between the original information requirement and new requirement.
   a) Information lose b) Information raise
   c) Information gain d) Information append

5) An _____ collects all of the information about subjects spanning the entire organization.
   a) Data Mart b) Enterprise warehouse
   c) Virtual warehouse d) Refresh

6) _____, which detects errors in the data and rectifies them when possible.
   a) Refresh Data b) Data Transformation
   c) Data Cleaning d) Data Extraction

7) _____ include concept description, association, classification, prediction and clustering.
   a) Kinds of Knowledge b) Task Relevant data
   c) Background Knowledge d) Interestingness measure

8) The class label of each training tuple is not known, and the number or set of classes to be learned may not to be learned may not be known in advance is known as: _____.
   a) self learning
   b) Unsupervised learning
   c) supervised learning
   d) None of these

9) An agglomerative hierarchical clustering method uses a _____strategy.
   a) Top-down
   b) Linear
   c) Random
   d) Bottom-up

10) The deeper the abstraction level, the smaller the corresponding threshold.
   a) Reduced Support
   b) Same support
   c) Uniform support
   d) Minimum support

B) Write true/false **06**

1) Linear regression involves finding the “best” line to fit two attributes so that one attribute can be used to predict the other.
2) Smoothing by bin medians can be employed, in which each bin value is replaced by the mean value.
3) Data cleaning routines attempt to fill in the missing values, smooth out noise while identifying outliers, and correct inconsistencies in the data.
4) Roll-up operation navigates from less detailed data to more detailed data.
5) OLTP system manages current data that, typically, are too detailed to be easily used for decision making.
6) The snowflake schema is variant of the star schema model.

Q.2 Answer the following. **16**

a) What is Data mart? Explain in with example.
b) Explain two-step process of model construction of classification.
c) Write a short note on DMQL.
d) Explain various backend tools and utilities while constructing data warehouse.

Q.3 Answer the following. **16**

a) Explain three-tier Data warehouse architecture with well labelled diagram.
b) What is data mining? Explain ‘Task Relevant Data’ as a primitive.

Q.4 Answer the following. **16**

a) What is Data warehouse? Explain the difference between OLTP and OLAP.
b) What is Association Rule? Explain ‘mining in multidimensional associations’.

Q.5 Answer the following. **16**

a) Explain different types of hierarchical clustering methods.

b) Explain decision tree induction method with example.

Q.6 Answer the following. **16**

a) Explain new trends in data mining.

b) What is supervised learning? Explain with suitable example.

Q.7 Answer the following. **16**

a) What is Weka? Explain various operations executed in weka.

b) What factors are needed to choose best data mining product.

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M.C.A. (Semester - III) (New) (CBCS) Examination: October/November - 2025
Open-Source Technologies (PHP, MySql) (MCA01309)

Day & Date: Tuesday, 11-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three from Q. 3 to Q. 7.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which of the following is a correct way to define a constant in PHP?
   a) define('CONST_NAME', 'Value');
   b) const CONST_NAME = 'Value';
   c) Both a and b
   d) None of these

2) When you use the $_GET variable to collect data, where is the data visible?
   a) In the URL
   b) Only to the server
   c) Only to the user who submitted the form
   d) Encrypted and hidden

3) Where is server-side scripting executed?
   a) On the client's web browser
   b) On the web server
   c) On a database server
   d) On a local machine without a server

4) PHP's ability to run on various operating systems like UNIX, Linux, and Windows highlights which of its advantages?
   a) High performance b) Platform independence
   c) Strong security features d) Extensive library support

5) To execute an SQL query in PHP using the mysqli extension, which function is typically used?
   a) mysqli_execute() b) mysqli_do_query()
   c) mysqli_run() d) mysqli_query()

6) How do you store data in a PHP session variable?
   a) $SESSION['key'] = 'value';
   b) $_SESSION['key'] = 'value';
   c) session_set('key', 'value');
   d) $_SERVER['SESSION'][’key'] = 'value';

7) Which of the following blocks is always executed, regardless of whether an exception occurs or not?
   a) try b) catch
   c) finally d) throw

8) Which operator is used for string concatenation in PHP?
   a) + b) .
   c) & d) *

9) Are PHP variables case-sensitive?
   a) Yes b) No
   c) Only for global variables d) Only for local variables

10) Which keyword is used to prevent a class from being extended by other classes?
   a) stop b) final
   c) sealed d) private

B) State whether True or False. **06**

1) Variable names in PHP are case-sensitive.
2) An empty array in PHP (array()) is considered false in a boolean context.
3) The 'if' statement in PHP always requires an 'else' part.
4) Associative arrays in PHP use numeric indexes only.
5) The 'throw' keyword is used in PHP to raise an exception.
6) The 'this' keyword is used inside a class to access its properties and methods.

Q.2 Answer the following. **16**

a) What are the characteristics of PHP?
b) What is Multidimensional array? Explain with example.
c) Explain different types of casting functions in PHP.
d) What are the Looping techniques supported by PHP.

Q.3 Answer the following.

a) What are different ways to create arrays? Write script to read and display multidimensional array. **08**
b) What are the advantages and disadvantages of PHP language? **08**

Q.4 Answer the following.

a) Explain data types in PHP with example. **08**
b) Explain any 4 types of String function with example. **08**

Q.5 Answer the following.

a) What is inheritance? Explain any three types with example. **08**
b) Explain different operators used in PHP. **08**

Q.6 Answer the following.

a)	What are different parameter passing techniques used in PHP? Explain with example.	**08**
b)	Explain the steps for connecting PHP with MySQL database. Write a script for inserting data into a table.	**08**

Q.7 Answer the following.

a)	Explain different Conditional statements in PHP with example.	**08**
b)	Explain various file functions in PHP with Example of each function.	**08**

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M.C.A. (Semester - III) (New) (CBCS) Examination: October/November – 2025
Applied Statistics (MSC16308)

Day & Date: Tuesday, 11-11-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to the right indicate full marks.

Q.1 A) Choose the correct alternatives: **10**

1) A fire in a factory delaying production for some weeks is _____.
   a) Seasonal Variation b) Secular Trend
   c) Cyclic Variation d) Irregular Variation

2) Mortality or health condition of persons in two cities are efficiently compare by using _____.
   a) CDR b) SDR
   c) STDR d) None of the above

3) The weights used in Paasche's formula belong to _____.
   a) The base period
   b) Association
   c) To any arbitrary chosen period
   d) None of the above

4) The component of a time series attached to long-term variation is termed as _____.
   a) cyclic variation b) secular variation
   c) irregular variation d) constancy

5) In simple random sampling with replacement, the same sampling unit may be included in the sample _____.
   a) Only once b) Only twice
   c) More than once d) Hundred times

6) Probability of drawing a unit at each selection remain same in _____.
   a) Simple random sampling with replacement (SRSWR)
   b) Simple random sampling without replacement (SRSWOR)
   c) Both SRSWR and SRSWOR
   d) Neither in SRSWR nor in SRSWOR

7) Variation due to assignable causes in the product occurs due to ____.
   a) faulty process
   b) carelessness of operators
   c) poor quality of raw material
   d) all the above

8) The geometric mean of Laspeyre's and Paasche's price indices is also known as _____.
   a) Cost of living index
   b) Fisher's price index
   c) Either cost of living index or Fisher's index
   d) Neither cost of living index nor Fisher's index

9) Specific death rate may be calculated according to _____.
   a) Age b) Gender
   c) Region or locality d) All of the above

10) Sampling frame is a term used for _____.
   a) A list of random numbers
   b) A list of voters
   c) A list of sampling units of a population
   d) Census survey

B) Fill in the blanks/True or False. **06**

1) Stratified sampling is also a method of random sampling.
2) Blood test is an example of sampling.
3) Fisher's index number satisfies time reversal test.
4) Base year for Index numbers should be a year in which war has occurred.
5) Fertility rate is concerned with number of deaths in a population.
6) Chance causes cannot be completely removed from the process

Q.2 Answer the following. **16**

a) Describe chance and assignable causes.
b) Describe Base shifting in Index numbers.
c) Discuss Life Tables.
d) Discuss non-sampling errors.

Q.3 Answer the following. **16**

a) What is time series? Describe in brief its components. Give example of each component
b) Define-
   i) Crude Birth Rate.
   ii) Crude Death Rate.
   iii) Laspeyre's Index number.
   iv) Standardized Death.

Q.4 Answer the following. **16**

a) The following table gives the number of defects observed in 8 woolen carpets passing as satisfactory. Construct the control chart for number of defects.

Sr. No. of carpets	1	2	3	4	5	6	7	8
No. of defects	2	5	5	6	1	5	1	7

b) Describe sampling and non-sampling errors.

Q.5 Answer the following. **16**

a) Explain the construction of mean and range control charts, giving formulae for upper and lower limits in both cases when sample means and sample ranges are given.

b) Describe Laspeyre's price index number and Paasche's price index number.

Q.6 Answer the following. **16**

a) Discuss the below methods for measurement of trend.

i) Moving average method.

ii) Progressive Average method.

b) Discuss stratified random sampling in details.

Q.7 Answer the following. **16**

a) Define the Fisher's index number. Show that it satisfies factor reversal test.

b) Discuss general fertility rate and age specific fertility rate.