Seat No.	

Set **P**

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Programming using C++ (MCA0101)

Day & Date: Friday, 17-04-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 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 alternative. **10**

1) Which of the following is not the arithmetic operator?
   a) + b) *
   c) < d) /

2) _____ is a symbolic name associated with a value and whose associated value may be changed during the execution of a program.
   a) Constant b) Label
   c) Variable d) Program name

3) In flow chart _____ represents information entering or leaving the system.
   a) Oval shape b) Parallelogram
   c) Circle d) Rectangle

4) The _____ statements help computer to execute a group of statements repeatedly.
   a) Assignment b) Looping
   c) if-else d) switch-case

5) In _____ compiler will automatically change one type of data into another.
   a) implicit conversion b) explicit conversion
   c) user defined conversion d) All of these

6) A member function can be defined outside the definition of class using _____.
   a) get from operator '>>' b) put to operator '<<'
   c) member operator '.' d) scope resolution operator '::'

7) To access an element of an object when using a pointer to the object, use the _____.
   a) arrow operator (->) b) member operator (.)
   c) address operator (&) d) all of these

8) The function ____ compares two strings and returns value 0 (zero) if they are equal.
   a) *strcat()* b) *strcmp()*
   c) *strlen()* d) *compare()*

9) A two - dimensional array can be seen as a table with $'x'$ rows and $'y'$ columns where the row number ranges from _____.
   a) $0\ to\ x-1$ b) $0\ to\ x$
   c) $0\ to\ y$ d) $x\ to\ y$

10) In inheritance the derived class inherits the capabilities of _____.
   a) Child class b) base classes
   c) Either child or base class d) either child or parent class

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

1) Constructors can take arguments but destructors cannot.
2) The fields in a class, of a C++ program are by default private.
3) A class can be derived from another derived class which is known as multilevel inheritance.
4) When the file is opened in the read-only mode, the existing contents are deleted and the output pointer is set at the beginning.
5) *'width()'* function of *ios* class specify the required field size for displaying an output value.
6) Destructors can be overloaded.

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

a) Member functions
b) Virtual function
c) Data hiding
d) Destructor

Q.3 Answer the following.

a) What is a flow chart? What are the symbols used to draw the flow chart? **08**
b) Write the algorithm and draw a flow chart to print 1 to 10 numbers. **08**

Q.4 Answer the following.

a) What are different types of operators available in C++? **08**
b) Explain 'switch' statement with example. **08**

Q.5 Answer the following.

a) What is constructor? Discuss various types of constructors with suitable example. **08**
b) Discuss any four string handling functions available in C++. **08**

Q.6 Answer the following.

a) Write a C++ program to demonstrate function overloading. **08**
b) What is inheritance? Discuss various types of inheritance. **08**

Q.7 Answer the following.

a)	What is role of manipulators in C++. Write down different manipulators in C++.	**08**
b)	Explain the role of *seekg(), seekp(), tellg(), tellp()* functions in the process of random.	**08**

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M.C.A. (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Structures (MCA0102)

Day & Date: Monday, 20-04-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any three questions 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 data structure is required to convert arithmetic expression in infix to its equivalent postfix notation?
   a) Queue b) Linked List
   c) Array d) Stack

2) _____ sorting is good to use when alphabetizing a large list of names.
   a) Merge b) Heap
   c) Radix d) Bubble

3) Which of the following are two-way lists?
   a) Grounded header list
   b) Circular header list
   c) Linked list with header and trailer nodes
   d) List traversed in two directions

4) To represent hierarchical relationship between elements, which data structure is suitable?
   a) Dequeue b) Priority
   c) Tree d) Graph

5) _____ form of access is used to add and remove data items from a stack.
   a) FIFO, First In First Out b) LIFO, Last In First Out
   c) Both a and b d) None of these

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

7) Process of removing an element from stack is called _____.
   a) Create b) Push
   c) Evaluation d) Pop

8) What kind of linked list is best to answer questions like “What is the item at position n?”
   a) Singly linked list
   b) Doubly linked list
   c) Circular linked list
   d) Array implementation of linked list

9) Which of the following data structures finds its use in recursion?
   a) Stack
   b) Arrays
   c) Linked List
   d) Queues

10) Which of the following traversing algorithm is not used to traverse in a tree?
   a) Post order
   b) Pre order
   c) In order
   d) Randomized

B) State True or False **06**

1) Most appropriate data structure to print a list of elements in reverse order is Queue data structure.
2) The largest value in a binary search tree is always stored at the right most node of the tree.
3) 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.
4) When an array is passed to a function, the function receives a copy of the array (call by value)
5) Most appropriate data structure to print a list of elements in reverse order is Queue data structure.
6) General ordered tree can be encoded into binary trees.

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

a) What is Data Structure?
b) Explain in brief Front and Rear?
c) State the meaning of Array Indexing?
d) What is Merge Sort?

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- 178, 900, 456, 800, 200, 600, 700, 500, 85, 100, 7, 400, 235, 300

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

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

a) What are the various application of Stack? Explain it with suitable example.

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

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

a) What is Stack Overflow and Underflow conditions? State it with suitable example?

b) What is Double Ended Queue? Discuss insertion and deletion operation on Circular Queue with suitable example.

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

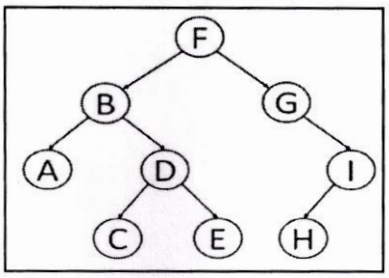
a) Explain Primitive versus Non-Primitive Data Structures with suitable example.

b) What do you mean by 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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M.C.A. (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced DBMS (MCA0103)

Day & Date: Wednesday, 22-04-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

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

1) Which of the following is a top-down approach in which the entity's higher level can be divided into two lower sub-entities?
   a) Aggregation b) Generalization
   c) Specialization d) All of the above

2) A _____ is used to refer to a program to fetch and process the rows returned by the SQL statement, one at a time.
   a) Procedure b) Cursor
   c) Loin d) View

3) Rollback of transaction is normally used to _____.
   a) Recovers from transaction failure
   b) Update the transaction
   c) Retrieves old records
   d) Repeats a transaction

4) DCL stands for _____.
   a) Data control language b) Data creation language
   c) Data compression language d) Data Calculation language

5) Rows of a relation are known as the _____.
   a) Degree b) Tuples
   c) Entity d) All of the above

6) Which one of the following keywords is used to find out the number of values in a column?
   a) TOTAL b) COUNT
   c) SUM d) ADD

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

8) The set of permitted values for an attribute is called _____.
   a) field value b) tuple
   c) domain d) None

9) _____ Cursor are programmer-defined cursors for gaining more control over the context area.
   a) View b) Explicit
   c) Implicit d) ERD

10) Double rectangles in ER-diagram represent _____.
   a) Weak entity b) Strong entity
   c) Derived entity d) None

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

1) The active state is the second state of every transaction.
2) SQL is not a Procedural language.
3) Triggers can operate on insertion, deletion, and updates.
4) An attribute is a characteristic or property of an entity.
5) WHERE is used to place a constraint on aggregated properties.
6) Data redundancy means reducing data duplication.

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

a) Explain Order By and Group By with an example each.
b) Elaborate on primary key and foreign key in short.
c) Explain the advantages of DBMS.
d) Explain ERD.

Q.3 Answer the following questions.

a) What are the different types of database users? **08**
b) Explain ACID properties in DBMS with an example. **08**

Q.4 Answer the following questions.

a) What is database recovery? Explain any two techniques for database recovery. **08**
b) What is database schema? Explain the select, project, natural join, union and cartesian product operations. **08**

Q.5 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.6 Answer the following questions.

a) Discuss two types of exceptions in PL/SQL in brief. **08**
b) Describe the steps involved in query processing. **08**

Q.7 Answer the following questions.

a) What is normalization? Explain 3NF & 4NF. **08**
b) Elaborate on Implicit and Explicit cursor with an example. **08**

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M.C.A. (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (MCA0104)

Day & Date: Friday, 24-04-2026 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 correct alternative. **10**

1) _____is a software development activity that is not a part of software processes.
   a) Validation b) Specification
   c) Development d) Dependence

2) What is Software Engineering?
   a) Designing a software
   b) Testing a software
   c) Application of engineering principles to the design a software
   d) None of the above

3) Attributes of good software is _____.
   a) Development b) Maintainability & functionality
   c) Functionality d) Maintainability

4) RAD stands for _____.
   a) Relative Application Development
   b) Rapid Application Document
   c) Rapid Application Development
   d) None of the above

5) _____ defines the properties of a data object and take on one of the three different characteristics.
   a) data object b) attributes
   c) relationships d) data object and attributes

6) _____ is not suitable for accommodating any change.
   a) RAD Model b) Waterfall Model
   c) Build and Fix Model d) Prototyping Model

7) Boundary value analysis belong to _____.
   a) White Box Testing
   b) Black Box Testing
   c) White Box & Black Box Testing
   d) None of the mentioned

8) Size and Complexity are a part of _____.
   a) Product Metrics b) Process Metrics
   c) Project Metrics d) All of the mentioned

9) What is the main aim of software engineering?
   a) Reliable software
   b) Cost effective software
   c) Reliable & cost effective software
   d) None of the above

10) RAD Model has _____.
   a) 2 phases b) 3 phases
   c) 5 phases d) 6 phases

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

1) White Box testing sometimes called glass-box testing.
2) Project plans should not be changed once they are adopted by a team.
3) Software engineering team structure is independent of problem complexity and size of the expected software products.
4) Agile teams are allowed to self-organize and make their own technical decisions.
5) Project risk affects the schedule or resources.
6) The goal of quality assurance is to provide management with the data needed to determine which software engineers are producing the most defects.

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

a) What is software prototyping?
b) Explain characteristic of software.
c) Explain Transform and Transaction mappings.
d) Write a note on Software Quality Assurance.

Q.3 Answer the following.

a) Explain elements of the analysis model. **08**
b) What is the difference between white box testing and black box testing? **08**

Q.4 Answer the following.

a) Explain Metric in process and the project domains. **08**
b) What is testing? Explain software testing strategies. **08**

Q.5 Answer the following.

a) Explain data modeling and functional modeling in detail. **08**
b) What is software design? Explain various concepts of Design. **08**

Q.6 Answer the following.

a)	What is software engineering? Explain different development phases in software engineering.	**08**
b)	Explain the linear sequential model.	**08**

Q.7 Answer the following.

a)	Explain the Architectural design optimization.	**08**
b)	Explain RAD model with its advantages.	**08**

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M.C.A. (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operating Systems (MCA0105)

Day & Date: Monday, 27-04-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 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 right indicate full marks.

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

1) _____ provides basis for application programs that acts as an intermediary between the computer user and the computer hardware.
   a) Application Software b) Operating system
   c) Shared Libraries d) Linked list

2) A _____ interface which uses a text instruction and a method to entering them.
   a) Computer b) Track ball
   c) Flip Flop d) Command

3) As processes enter the system, they are put into a _____, which consists of all processes in the system.
   a) Device queue b) System queue
   c) Job queue d) Ready queue

4) The _____ buffer sometimes refers to as a message system with no buffering.
   a) Zero capacity b) Single capacity
   c) Double capacity d) Unbounded capacity

5) The _____ is the module that gives control of the CPU to the process selected by the scheduler.
   a) Memory Scheduler b) Dispatcher
   c) Control system d) I/O Event Wait

6) The value of _____ semaphore can range over an unrestricted domain.
   a) Binary b) Decimal
   c) Monitor d) Counting

7) In _____ algorithm, a small unit of time quantum or time slice is defined.
   a) Long term scheduler b) Round Robin
   b) Shortest Job First d) Priority

8) The _____ name begins at root and follows a path down to a specified file, giving the directory names on path.
   a) Relative path b) Directory path
   c) Absolute path d) File-Directory path

9) The _____ is akin to reader lock in that several processes can acquire the lock concurrently.
   a) Shared Lock b) Exclusive Lock
   c) System Lock d) Hardware Lock

10) A _____ is associated with each process, and the CPU is allocated to the process with highest of it.
   a) Preemption b) Non preemption
   c) Priority d) Disk Storage

B) True or False: **06**

1) A preemptive kernel allows a process to be preempted while it is running in kernel mode.
2) The Distributed System is tightly coupled software on the same loosely coupled hardware.
3) The rows of the access matrix represent domains, and the columns represent objects.
4) The multiprocessor time sharing systems is tightly coupled software on tightly coupled hardware.
5) Fragmentation is the violation of the system can be categorized as intentional and accidental.
6) A logical memory divided into same sized blocks is called as frame.

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

a) Race Condition
b) Process Control Block
c) Physical and Logical Addresses
d) File

Q.3 Answer the following.

a) Explain in detail concept of Process synchronization with suitable example. **08**
b) State and explain C-SCAN D Disk Scheduling method with suitable example. **08**

Q.4 Answer the question.

a) What is Multi-programmed System? Explain in detail different types of schedulers and their task of control. **08**
b) What is Demand paging? Explain in detail steps in involved in handling Page fault. **08**

Q.5 Answer the questions.

a) What is Cooperative Process? State Inter-Process Communication with suitable example. **08**

b) Perform Most Recently Used (MRU) Page replacement algorithm on following reference page series using maximum 03 frames – **08**
1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 7, 0, 0, 1, 7, 0, 1

Q.6 Answer the following.

a) What is Operating System? Explain the characteristics and role of Operating System. **08**

b) State and explain Round Robin CPU scheduling algorithm with suitable example. **08**

Q.7 Answer the following questions.

a) Define the Deadlock. State and explain in detail necessary conditions to cause a deadlock. **08**

b) 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: March/April – 2026
Discrete Mathematical Structures (MCA0109)

Day & Date: Wednesday, 29-04-2026 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) If A and B are disjoint sets the $A \cap B =$ _____.
   a) A b) B
   c) U d) φ

2) If all the entries in the last column of the truth table of a given statement pattern are T then the statement pattern is called a _____.
   a) contradiction b) tautology
   c) contingency d) None of these

3) The elements on the main diagonal of a skew-symmetric matrix are always _____.
   a) 0 b) 1
   c) -1 d) All the these

4) Which of the following is a group?
   a) $(Z^+, \times)$ b) $(N, +)$
   c) $(Z, +)$ d) None of these

5) The generating function for the sequence $(1,1,1, \ldots)$ is _____.
   a) $\frac{1}{1-2x}$ b) $\frac{1}{1-x}$
   c) $\frac{1}{1-x^2}$ d) $\frac{1}{1+x}$

6) If $|A| = 5$ then the $|P(A)| =$ _____, where $P(A)$ is the power set of A.
   a) 5 b) 10
   c) 32 d) 16

7) In a graph, a vertex of degree zero is called _____ vertex.
   a) pendant b) isolated
   c) zero d) non-isolated

8) How many permutations of the letters of the word BANANA are possible?
   a) 20 b) 30
   c) 60 d) 40

9) A Relation R on a set A is called a partial order relation if it is _____.
   a) Reflexive b) Anti-symmetric
   c) Transitive d) All of these

10) Which of the following statements is false?
   a) $p \vee T \equiv F$ b) $p \vee p \equiv p$
   c) $p \wedge T \equiv p$ d) $p \vee F \equiv p$

B) State whether the following statements are true or false. **06**

1) The union of any non-empty set A and the null set is the set A.
2) If the statements p and q are true and r is false then truth value of $p \vee (q \wedge r)$ is F.
3) An edge is said to be a loop if its end vertices are same.
4) If A and B are two matrices such that $AB = 0$ then either of A or B is a zero matrix.
5) Every identity relation is a reflexive relation.
6) The algebraic structure $(R, +)$ is a group, where R is the set of real numbers.

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

a) Define a Singular Matrix. Also show that the matrix $\begin{bmatrix} a & 1 & b+c \\ b & 1 & c+a \\ c & 1 & a+b \end{bmatrix}$ is a singular matrix.

b) Write the negations of the following statement patterns:
   i) $(p \wedge \sim q) \vee (p \rightarrow q)$
   ii) $(p \leftrightarrow q) \vee (\sim q \wedge r)$

c) Define Composite Mapping.

d) Evaluate $C(6,2), C(10,7)$

Q.3 Answer the following.

a) Find inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 3 & 0 \\ 5 & 2 & -1 \end{bmatrix}$ by the adjoint method. **06**

b) Define Functions and types of functions using diagrams. **10**

Q.4 Answer the following.

a) If $C(1000,98) = C(999,97) + C(x, 901)$ then find the value of x. **06**

b) Prove the given logical equivalence using truth table **10**
   i) $\sim p \wedge q \equiv (p \vee q) \wedge \sim p$
   ii) $\sim (p \vee q) \vee (\sim p \wedge q) \equiv \sim p$

Q.5 Answer the following.

a) Show that in a graph, the number of vertices of odd degree is even. **08**

b) Show that the set $\{1,2,3,4,5\}$ is not a group under addition modulo 6. **08**

Q.6 Answer the following.

a) Find $A+B, 2A-3B, A-B, AB$ if **10**

$$A=\begin{bmatrix}2 & 3 & 4\\ 5 & 6 & 7\\ 8 & 5 & 11\end{bmatrix} \text{ and } B=\begin{bmatrix}3 & -2 & -3\\ 5 & 4 & 3\\ 1 & 3 & 2\end{bmatrix}$$

b) If $X=\{a,b,c\}$ then draw the Hasse diagram of $(P(X),\subseteq)$. **06**

Q.7 Answer the following.

a) Examine whether the following statement pattern is a tautology or a contradiction or a contingency: $(p \rightarrow q) \leftrightarrow (\sim p \vee q)$ **06**

b) Define walk, trail, path, circuit, cycle using suitable example. **10**

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M.C.A. (Semester - II) (New) (CBCS) Examination: March/April - 2026
Java Programming (MCA01201)

Day & Date: Thursday, 16-04-2026 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. 3 to Q. 7.
3) Figures to the right indicate full marks.

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

1) A collection of methods with no implementation is called an _____.
   a) Polymorphism b) Inheritance
   c) Interface d) Data Binding

2) Which of the following is not a primitive data type in Java?
   a) double b) short
   c) string d) char

3) What is the range of data type short in Java?
   a) -128 to 127
   b) - 32768 to 32767
   c) - 2147483648 to 2147483647
   d) None of the mentioned

4) The _____ class creates and maintains a buffer for an input stream.
   a) Common Buffered Input Stream
   b) Buffered Stream
   c) Input Stream
   d) Buffered Input Stream

5) Which of the following is a loop construct that will always be executed once?
   a) switch b) for
   c) while d) do…..while

6) _____ provides a database-programming interface for Java programs.
   a) JDBC b) ODBC
   c) DBMS d) DAT

7) _____ is the ability of Java application to perform multiple tasks at the same time.
   a) Multiprogramming b) Multithreading
   c) Multiprocessing d) Multitasking

8) Which operator is used to create an object?
   a) class b) new
   c) print d) main

9) A class that is inherited is called a _____.
   a) Superclass b) Subclass
   c) Subsetclass d) Relativeclass

10) The class at the top of the exception classes hierarchy is called ____.
   a) throwable b) catchable
   c) hierarchical d) None of these

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

1) All binary operators except for the assignment operators are evaluated from Left to Right.
2) Private members of class can only be accessed by other members of the class.
3) Every class must contain a main() method.
4) It is possible to override private methods.
5) Is it possible to write a class within the interface.
6) Enumerations are a special data type in Java that allows for a variable to be set to a predefined variable.

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

a) Differentiate a Interface and Abstract class.
b) Define control loop for two conditions.
c) Describe arrays in Java.
d) Give the purpose of throw and throws keyword.

Q.3 Answer the following.

a) How to use a try- catch block, Explain with suitable example. **08**
b) Explain the features of Java. **08**

Q.4 Answer the following.

a) What are different AWT controls? Explain any two in detail. **08**
b) Explain the concept of Multithreading by Runnable interface. **08**

Q.5 Answer the following.

a) What the use of *this* & *super* keyword? **08**
b) Write a program to take array data as input from console and sort it in descending order. **08**

Q.6 Answer the following.

a) Explain Thread life cycle in java. **08**
b) Explain Architecture of JDBC. **08**

Q.7 Answer the following.

a)	Explain different steps involved for making a connection with a database.	**08**
b)	What is the difference between exception and error in java? Explain how exceptions are handled in java.	**08**

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M.C.A. (Semester - II) (New) (CBCS) Examination: March/April – 2026
Python Programming (MCA01202)

Day & Date: Saturday, 18-04-2026 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 is the output of $print(0.3 == 0.3)$?
   a) True b) False
   c) Machine dependent d) Error

2) Which of the following statements create a dictionary?
   a) $d = \{\}$ b) $d = \{\text{“john”}: 40, \text{“peter”}: 45\}$
   c) $d = \{40: \text{”john”}, 45: \text{”peter”}\}$ d) All of the mentioned

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

$$d1 = \{\text{"john"}: 40, \text{"peter"}: 45\}$$
$$d2 = \{\text{"jonh"}: 40, \text{"peter"}: 45\}$$
$$d1 == d2$$

   a) True b) False
   c) 45 d) Error

4) Which of the following is a Python tuple?
   a) $[1, 2, 3]$ b) $(1, 2, 3)$
   c) $\{1, 2, 3\}$ d) $\{\}$

5) Suppose $t = (40, 20, 41, 31)$, which of the following is incorrect?
   a) print(t[3J) b) $\text{t}[3] = 45$
   c) print(max(t)) d) print(len(t))

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

$$>>> t = (1, 2)$$
$$>>> t + t$$

   a) (1, 2, 1, 2) b) [1, 2, 1, 2]
   c) (1, 1, 2, 2) d) [1, 1, 2, 2]

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

$$nums = set([1, 1, 2, 3, 3, 3, 4, 4])$$
$$print(len(nums))$$

a) 7
b) Error, invalid syntax for formation of set
c) 4
d) 8

8) What is the output of this expression, 5 * 1 * * 5?
a) 25 b) 75
c) 5 d) 1

9) The dictionary is declared in _____ bracket.
a) ( ) b) [ ]
c) (( )) d) { }

10) Which OS module is used to change the current path to another?
a) os.cd() b) os.change()
c) os.changedir() d) os.chdir()

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

1) Python is free and open source software.
2) In Python Pandas is a data analysis and modeling library.
3) Python concatenates two string literals that are placed side by side.
4) Empty tuple can be created using [ ].
5) Two sets are equal if and only if every element of one set is contained in other set.
6) *tkinter* is distributed alongwith Python software and has a commonly used GUI elements such as buttons, menus etc.

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

a) Features of Python
b) _ _init() _ _method
c) Various operators in Python
d) Advantages of tuple over list

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

a) Discuss the following List functions:
i) len()
ii) sum()
iii) any()
iv) all()

b) Describe various looping statements in Python with example.

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

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

b) Explain the concept of scope and lifetime of variables in Python programming language with an example.

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

a) Discuss the following dictionary methods with an example.

i) get()
ii) keys()
iii) values()
iv) items()

b) What is Python Module? What is OS module in Python? Explain any five functions in OS module.

Q.6 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?

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

a) Write a program to find the sum of all Odd and Even numbers up to a number specified by the user.

b) Describe the different access modes of the files with an example.

Seat No.	

Set **P**

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April – 2026
Computer Communication Network (MCA01203)

Day & Date: Tuesday, 21-04-2026 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) Which type of topology is best suited for large businesses which must carefully control and coordinate the operation of distributed branch outlets?
   a) Ring b) Local area
   c) Hierarchical d) Star

2) Which of the following transmission directions listed is not a legitimate channel?
   a) Simplex b) Half Duplex
   c) Full Duplex d) Double Duplex

3) What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences?
   a) Unshielded twisted pair b) Optical fiber
   c) Coaxial cable d) Microwave

4) A collection of hyperlinked documents on the internet forms the _____.
   a) World Wide Web (WWW) b) E-mail system
   c) Mailing list d) Hypertext markup language

5) The location of a resource on the internet is given by its _____.
   a) Protocol b) URL
   c) E-mail address d) ICQ

6) The term HTTP stands for _____.
   a) Hyper terminal tracing program
   b) Hypertext tracing protocol
   c) Hypertext transfer protocol
   d) Hypertext transfer program

7) A proxy server is used as the computer _____.
   a) with external access b) acting as a backup
   c) performing file handling d) accessing user permission

8) Which software prevents the external access to a system?
   a) Firewall b) Gateway
   c) Router d) Virus checker

9) Which one of the following is the most common internet protocol?
   a) HTML b) NetBEUI
   c) TCP/IP d) IPX/SPX

10) Software programs that allow you to legally copy files and give them away at no cost are called _____.
   a) Probe ware b) Timeshare
   c) Shareware d) Public domain

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

1) HTTP is a mark-up language.
2) Protocol is an agreement between the communicating parties on how communication is to proceed.
3) In a peer-to-peer network, any client computer can also be a server.
4) A collection of interconnected computers and devices that can communicate and share resources is called computer network.
5) A hub connects two different LANs.
6) ICMP reports on the success or failure of data delivery.

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

a) Computer Network.
b) LAN.
c) Uses of Internet.
d) Circuit Switching.

Q.3 Answer the following.

a) State and explain IPv4 header format. **08**
b) What are the different error detecting codes? Explain any one with example. **08**

Q.4 Answer the following.

a) What is sliding windows protocol? Explain one-bit sliding windows protocol. **08**
b) Describe Wide Area Network (WAN) and its components. **08**

Q.5 Answer the following.

a) Explain HTTP protocol in detail. **08**
b) Explain routing for mobile hosts. **08**

Q.6 Answer the following.

a) Discuss electronic mail architecture. **08**
b) What is the need of Framing? Explain character stuffing and bit stuffing for framing. **08**

Q.7 Answer the following.

a) Explain HDLC in detail. **08**
b) Explain Real Time Transport Protocol in detail. **08**

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Set | P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April – 2026
System Software (MCA01204)

Day & Date: Thursday, 23-04-2026 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) Multiple choice questions: **10**

1) The Sun Micro Systems processors usually follow _____ architecture.
   a) CISC b) ISA
   c) ULTRA SPARC d) RISC

2) 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

3) The beginning of the macro can be represented as _____.
   a) START b) BEGIN
   c) MACRO d) None of the mentioned

4) What does YACC stand for?
   a) Yet Another Compiler-Compiler
   b) Yacc Algorithm Compiler
   c) Yet Another Computer Compiler
   d) Yet Another Compiler

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

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) Macro assemblers can perform _____.
   a) Translation b) Macro-expansion
   c) Both (a) and (b) d) None of these

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) The bootloader is responsible for loading the operating system.
2) Assembler is used as a translator for high level language.
3) The RISC processor has a more complicated design than CISC.
4) Compilers only check for syntax errors in the code.
5) CISC architecture is power efficient.
6) Assemblers can directly interact with a computer's hardware.

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

a) Dynamic linking
b) YACC Compiler
c) SPARC assembler
d) Compiler functions

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 Macro processing features and ANSI C programming language with suitable example.
b) What is Compiler? Explain Compiler design options.

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

a) Explain machine-independent features of Macro processor.
b) What is linking? Explain different types of linking in detail.

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

a) What is Bootstrap Loader? Explain in detail design of Absolute Loader and related functions.
b) Explain machine-dependent and machine-independent compiler features.

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

a) Differentiate between RISC and CISC machines.
b) Explain Conditional Macro Expansion with example.

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Set | P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April - 2026
UML (MCA01207)

Day & Date: Saturday, 25-04-2026 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) What does UML stand for?
   a) Unified Modeling Layout
   b) Universal Modeling Language
   c) Unified Modeling Language
   d) Unified Machine Learning

2) UML is primarily used for which of the following?
   a) Programming b) Output design
   c) System modeling d) Code testing

3) Which diagram is used to model the functional requirements of a system?
   a) State Diagram b) Use Case Diagram
   c) Activity Diagram d) Class Diagram

4) Which of the following shows the interactions between objects over time?
   a) Sequence Diagram b) Activity Diagram
   c) Class Diagram d) Use Case Diagram

5) What does the multiplicity "1.. *" represent?
   a) Zero or one instance b) Exactly one instance
   c) One or more instances d) Any number of instances

6) A dashed arrow in UML represents which relationship?
   a) Dependency b) Association
   c) Generalization d) Aggregation

7) In UML, inheritance is represented by which relationship?
   a) Generalization b) Association
   b) Aggregation d) Composition

8) What does a vertical dashed line represent in a Sequence Diagram?
   a) Lifeline b) Execution time
   c) Message d) Object destruction

9) What symbol represents the start of an Activity Diagram?
   a) Oval b) Filled circle
   c) Diamond d) Arrow

10) In UML, a package is represented by _____.
   a) Tabbed folder b) Diamond
   c) Rectangle d) Oval

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

1) UML is only applicable to object-oriented systems.
2) UML supports both forward and reverse engineering.
3) Use Case Diagrams describe the functional requirements of a system.
4) Activity Diagrams model workflows and processes.
5) Sequence Diagrams show the interaction between objects over time.
6) Stereotypes in UML allow the customization of elements.

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

a) Purpose of UML
b) Generalization in UML
c) Swimlane in Activity Diagram
d) Packages

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

a) What is an Object Diagram, and how is it different from a Class Diagram?
b) What is a Component Diagram, and why is it used?

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

a) What is a diagram in UML? What are the different kinds of diagram in UML?
b) What are the principles of modeling? Explain importance of modeling.

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

a) What is a Use Case Diagram, and what are its key components?
b) Explain activity diagram. Describe fork and join.

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

a) Draw a neat use case diagram for online railway reservation system.
b) What is use case? Explain different elements in use case with an example.

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

a) What are the various relationships used in UML?
b) Explain UML software development life cycle.

Seat No.	

Set **P**

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April – 2026
Graph Theory (MCA01208)

Day & Date: Saturday, 25-04-2026 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) A graph is defined as _____.
   a) Set of numbers b) Pair (V, E)
   c) Matrix d) Tree

2) Vertex colouring assigns colours to _____.
   a) Edges b) Faces
   c) Vertices d) Paths

3) A spanning tree with n vertices has _____.
   a) $n-1$ edges b) n edges
   c) $n+1$ edges d) n^2 edges

4) Which graph is non-planar?
   a) Tree b) Cycle
   c) K_5 d) Path

5) The Euler's formula is given by _____.
   a) $V+E=F$ b) $V+F=E$
   c) $V-E=F$ d) $V-E+F=2$

6) Maximum flow is found using _____algorithm.
   a) DFS b) Kruskal
   c) Ford-Fulkerson d) Prim

7) A perfect matching covers _____.
   a) All edges b) All vertices
   c) Half vertices d) Cycles

8) Eulerian circuit exists if _____.
   a) All vertices even b) All vertices odd
   c) Graph disconnected d) One vertex

9) Chromatic number represents _____.
   a) Maximum colours b) Faces
   c) Edges d) Minimum colours

10) A clique is _____.
   a) Independent set b) Tree
   c) Complete subgraph d) Cycle

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

1) A cut-set increases components when removed.
2) Every planar graph is bipartite.
3) A graph with two odd vertices has Eulerian path.
4) Every complete graph is planar.
5) A dominating set covers all vertices directly or indirectly.
6) All trees are cyclic.

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

a) Define graph and types of graphs.
b) Define spanning tree and its properties.
c) Explain graph colouring and chromatic number.
d) Define matching and perfect matching.

Q.3 Answer the following questions.

a) Explain algorithmic complexity and linear-time algorithms. **10**
b) Explain connectivity of a graph. **06**

Q.4 Answer the following questions.

a) Explain maximum flow problem and Ford-Fulkerson algorithm. **10**
b) Explain the four colour theorem. **06**

Q.5 Answer the following questions.

a) Explain the Chinese postman problem. **08**
b) Explain Eulerian paths and circuits with suitable examples. **08**

Q.6 Answer the following questions.

a) Write short note on **08**
   i) Genus
   ii) Dual graphs
b) Show that the number of odd vertices in any graph is always even. **08**

Q.7 Answer the following questions.

a) Explain walk, path, trail, cycle, circuit in a graph using suitable examples. **10**
b) Explain minimum-cost flow algorithm. **06**

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Seat No.		Set	P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April – 2026
Office Automation (MCA01209)

Day & Date: Tuesday, 28-04-2026 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) _____ creates a new blank document based on the default template.
   a) Open b) Save
   c) New d) Print

2) PowerPoint presentations are widely used as _____.
   a) Note Outlines for teachers
   b) Project Presentation by students
   c) Communication of planning
   d) All of above

3) What is a form in MS Access?
   a) It is an input screen designed to make the viewing and entering data easier
   b) It is a printed page where users will write their data to fill it up
   c) This is an important part of database used by analysts to draw conclusions
   d) All of above

4) In MS Access, a field value may contain _____.
   a) Text b) Numbers
   c) Dates d) All of the above

5) What is full form of CPU?
   a) Computer Processing Unit b) Computer Principal Unit
   c) Central Processing Unit d) Control Processing Unit

6) Second generation of computer are made of _____.
   a) Transistor b) LSI
   c) Vacuum Tubes d) None of these

7) What function is used to calculate the average of a range of cells?
   a) SUM() b) COUNT()
   c) AVERAGE() d) MAX()

8) What is the default numbering format for footnotes in Word?
   a) Roman numerals
   b) Alphabetical letters
   c) Arabic numerals (1,2,3…)
   d) Bullet points

9) The taskbar is located _____.
   a) on the start menu
   b) at the bottom of the screen
   c) on the quick launch toolbar
   d) at the top of the screen

10) 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

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

1) The find and replace feature helps to quickly locate and change text in a document.
2) Text alignment options include left, right, and justify.
3) RAM is a type of permanent storage.
4) MS Access is a relational database management system.
5) Microsoft Word is an example of system software.
6) In Word documents cannot be converted into PDF format.

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

a) What is the difference between a footnote and endnote?
b) Explain save and save as command in MS-Word.
c) What is Input Device? Explain the use of Output Device with example.
d) How to insert page number on MS-Word.

Q.3 Answer the following questions

a) What is Mail Merge? Explain the Procedure for mail merging. **08**
b) What is Presentation? Explain Creating presentation in MS-PowerPoint. **08**

Q.4 Answer the following questions

a) What is table in MS-Word? And explain different operation on table. **08**
b) What is Macro? How to create a macro in Word? **08**

Q.5 Answer the following questions.

a) What are Desktop icons and their functions? **08**
b) How to insert a header and footer in Microsoft word document? **08**

Q.6 Answer the following.

a)	Explain the components of Microsoft access. Describe each in detail.	**08**
b)	What is Conditional formatting? And how do you apply it?	**08**

Q.7 Answer the following questions.

a)	Explain any four shortcut keys in MS-Word.	**08**
b)	Explain the process of creating forms in MS Access and how are forms useful?	**08**

Seat No.	

Set **P**

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April – 2026
NET Technology (MCA01301)

Day & Date: Friday, 17-04-2026 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) What is the return type of IsPostBack property?
   a) Integer b) Boolean
   c) Float d) All of these

2) What namespace is used for ASP.NET Web Form by default?
   a) System.Web.Form b) System.Web.Ul.Page
   c) System.Web.GUI.Page d) System.Web.UI.Form

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

4) _____ 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) DLL d) MSIL

5) Which of the following folder is used to store DLL files in the ASP.NET application?
   a) App_Code b) App_Data
   c) Bin d) App_Local

6) The _____ is responsible for allocating, freeing, and compacting memory.
   a) type checker b) garbage collector
   c) code manager d) memory manager

7) Which is the first event triggered when a user requests an ASP.NET page?
   a) Load b) Init
   c) Prelnit d) PreLoad

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

9) Reference is a _____.
   a) Copy of class which leads to memory allocation
   b) Copy of class that is not initialized
   c) Pre-defined data type
   d) Copy of class creating by an existing instance

10) Which of the following are server controls in ASP.NET?
   i) Button
   ii) Textbox
   iii) ImageButton
   iv) LinkButton
   a) i) and ii) b) i), ii) and iii)
   c) Only i) d) All

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

1) Classes declared with the sealed keyword cannot be base class.
2) All methods in an abstract base class must be declared abstract.
3) Panel webserver control used as container for other server controls in a ASP.NET webpage.
4) SOAP stands for Simple object access protocol.
5) We can use ASPX pages in MVC.
6) The SessionIDs are stored in Cache by ASP.Net

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

a) Explain Master Page in brief and its need.
b) C# features
c) Client side validation and server side validation
d) Explain Global.asax

Q.3 Answer the following questions.

a) Difference between asp and asp.net **08**
b) Explain in brief about managing the state in asp.net **08**

Q.4 Answer the following questions.

a) Explain in brief ASP.net server controls. **08**
b) Explain in brief MVC. **08**

Q.5 Answer the following questions.

a) Explain ASP.net page life cycle events. **08**
b) Explain in brief about CLR, CLS, CTS, MSIL. **08**

Q.6 Answer the following questions.

a) Explain page directives. **08**

b) Explain in brief master page events. **08**

Q.7 Answer the following.

a) Explain different control statements. **08**

b) Explain any two of WebPartsManager, CatalogPart, PageCatalogPart, EditorPart, WebPartZOne. **08**

Seat No.	

Set **P**

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

Day & Date: Monday, 20-04-2026 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) An image is represented as a matrix of _____.
   a) Bits b) Pixels
   c) Blocks d) Bytes

2) Which of the following is used to reduce noise in an image?
   a) Histogram equalization b) Edge detection
   c) Smoothing filter d) Segmentation

3) Morphological operations are primarily used for _____.
   a) Frequency analysis b) Image smoothing
   c) Shape analysis d) Color enhancement

4) In binary morphology, which operation expands the boundaries of foreground (white) regions?
   a) Erosion b) Dilation
   c) Closing d) Subtraction

5) Which structuring element is commonly used in morphological operations?
   a) Gaussian kernel
   b) Laplacian matrix
   c) Square or disk-shaped binary mask
   d) Edge detection filter

6) Hit-or-Miss transform is used for _____.
   a) Color detection b) Shape detection
   c) Image enhancement d) Noise removal

7) What is the main goal of image segmentation?
   a) Compress image data
   b) Enhance image quality
   c) Partition an image into meaningful regions
   d) Convert grayscale to color

8) In edge-based segmentation, what indicates the boundary between regions?
   a) Color
   b) High texture
   c) Discontinuities in intensity
   d) Smooth gradients

9) Which of the following filters is most effective for reducing salt-and-pepper noise?
   a) Average filter
   b) Gaussian filter
   c) Median filter
   d) Laplacian filter

10) 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

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

1) The goal of segmentation is to represent the entire image with a single homogeneous region.
2) Closing is dilation followed by erosion.
3) Erosion removes small objects or shrinks object boundaries.
4) Image enhancement is primarily aimed at improving image appearance for human viewers.
5) Quantization refers to the process of digitizing spatial coordinates.
6) Image restoration aims to recover the original image from a degraded one.

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

a) Explain the logarithmic transformations.
b) Write a short note on digital image representation.
c) Explain erosion operation in morphology.
d) Explain thresholding techniques for segmentation.

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

a) Explain sampling and quantization with suitable diagrams.
b) Describe the various applications of digital image processing.

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

a) Explain histogram equalization and its advantages.
b) Explain frequency domain enhancement techniques.

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

a) What is image restoration? Explain image degradation model.
b) Discuss opening and closing operations.

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

a) Define image segmentation and its purpose. Explain region-based segmentation.
b) Describe smoothing spatial filters with examples.

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

a) Explain thinning and thickening operations.

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

Seat No.	

Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April – 2026
Mobile Computing (MCA01303)

Day & Date: Wednesday, 22-04-2026 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 right indicate full marks.

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

1) Which multiplexing technique uses different carrier frequencies for each channel?
   a) TDM b) FDM
   c) CDM d) SDM

2) The main concept of a cellular system is _____.
   a) Large single transmitter covers the whole city
   b) Divide area into cells and reuse frequencies
   c) Assign a unique frequency to every user
   d) None of these

3) The maximum throughput of Pure Aloha is approximately _____.
   a) 18% b) 36%
   c) 50% d) 75%

4) The Mobile Switching Center (MSC) is responsible for _____.
   a) Radio transmission
   b) Switching calls and mobility management
   c) Storing user location permanently
   d) Encrypting data

5) The A3 algorithm in GSM is used for _____.
   a) Encryption b) Authentication
   c) Frequency hopping d) Handover decision

6) In an infrastructure-based WLAN, communication occurs through _____.
   a) Satellite link b) Peer-to-peer links only
   c) Base Station Controller d) Access Point (AP)

7) The temporary IP address assigned to a Mobile Node (MN) while visiting a foreign network is called _____.
   a) Home Address b) Care-of Address
   b) Subnet Mask d) Agent Address

8) Snooping TCP improves performance by _____.
   a) Hiding wireless errors from the sender
   b) Disabling congestion control
   c) Forcing TCP to use UDP
   d) Reducing window size permanently

9) The file that describes essential information about an Android app is _____.
   a) activity_main.xml b) AndroidManifest.xml
   c) MainActivity.java d) strings.xml

10) In Android, which method is called when an Activity is first created?
   a) onStart() b) onCreate()
   c) onResume() d) onPause()

B) Fill in the blanks **06**

1) The layout that arranges elements either in a single row or column is _____.
2) The method called when an Activity becomes visible to the user is _____.
3) The near-far problem is mainly associated with _____.
4) IMEI stands for _____.
5) Multiple interconnected Bluetooth Pico-nets form a _____.
6) The lowest layer in Android architecture is _____.

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

a) Write a note on Path loss of radio signals.
b) What are the different Mobile services provided by the GSM.
c) Write about IP Packet delivery to and from the mobile node.
d) Write about the Android Application Manifest file.

Q.3 Answer the following.

a) What is Multiplexing? Explain Frequency division Multiplexing. **08**
b) What is Modulation? Explain Advanced phase shift keying. **08**

Q.4 Answer the question.

a) What is Spread spectrum? Explain Frequency hopping spread spectrum. **08**
b) What is Handover? Explain types of Handover in GSM System. **08**

Q.5 Answer the following.

a) Draw and explain the System architecture of an infrastructure-based IEEE 802.11 **08**
b) Draw a Use Case diagram and Explain Mobile Originated Call (MOC) Process. **08**

Q.6 Answer the following.

a) Explain Mobile TCP. Write its advantages and disadvantages. **08**

b) Create a simple android GUI based applications with event handling. **08**

Q.7 Answer the following.

a) Explain Android System Architecture. **08**

b) Explain the Discovering and Bonding with Bluetooth Devices. **08**

Seat No.	

Set **P**

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April – 2026
Artificial Intelligence (MCA01304)

Day & Date: Friday, 24-04-2026 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) The “Father of Artificial Intelligence” is ____.
   a) Alan Turing b) John McCarthy
   c) Charles Babbage d) None of these

2) Which of the following algorithm related to Artificial Intelligence?
   a) Routing Algorithm b) Greedy Algorithm
   c) Hill Climbing Algorithm d) Recursive Algorithm

3) A* algorithm is based on _____.
   a) Breadth-First-Search b) Depth-First-Search
   c) Uniform Cost Search d) Best-First-Search

4) A _____ representation is one in which knowledge is specified but the use to which that knowledge is to put is not given.
   a) Procedural b) Baye’s
   c) Declarative d) Semantic net

5) Inference engine work on the principle of?
   a) Backward Chaining b) Forward Chaining
   c) Both a and b d) None of these

6) In artificial Intelligence, knowledge can be represented as _____.
   a) Predicate Logic b) Propositional Logic
   c) Both a & b d) None of the these

7) _____ of the following is a component of an expert system.
   a) Inference engine b) Knowledge base
   c) User interface d) All of the these

8) Which of the following search method takes less memory space?
   a) Depth First Search b) Breadth -First Search
   c) Linear Search d) Optimal Search

9) On which of the following approaches a basic line following robot is based?
   a) Applied approaches b) Weak Approach
   c) Strong Approach d) Cognitive Approach

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) An Al technique refers to a specific method used to solve problems, such as algorithms, rules, or heuristics.
2) A rule-based system consists of a set of rules, a knowledge base, and an inference engine that manipulates the rules to generate conclusions.
3) Common approaches to knowledge representation include logic, semantic networks, and frames.
4) Predicate logic uses predicates to represent relationships between objects and entities, allowing for formal reasoning.
5) In semantic networks, concepts are represented as nodes and relationships between them are represented as edges.
6) An expert system shell is a software framework that provides tools for building expert systems without the need for extensive programming.

Q.2 Short Notes: **16**

a) Production system
b) Scripts
c) Minmax Search
d) Backward reasoning

Q.3 Answer the following questions.

a) What is Artificial Intelligence? Explain Al Technique. **08**
b) Explain Depth-First Search algorithm in detail. **08**

Q.4 Answer the questions.

a) What is heuristic? Explain Best-First Search algorithm in detail. **08**
b) Explain Certainty Factors and Rule based system in detail. **08**

Q.5 Answer the questions.

a) Explain Alpha-Beta cutoffs and their significance in game playing. **08**
b) What is Production System? Explain its Characteristics. **08**

Q.6 Answer the following.

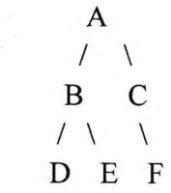
a) What is Fuzzy Logic? Discuss its importance in Al. **08**

b) What is Natural Language Processing? Explain its importance in AI. **08**

Q.7 Answer the following questions.

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

b) Solve this below problem using breadth first search and Depth first search algorithm. **08**



Seat No.	

Set | P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April – 2026
Data Mining and Warehouse (MCA01307)

Day & Date: Monday, 27-04-2026 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) _____ predicts future trends & behaviours, allowing business managers to make proactive, knowledge-driven decisions.
   a) Data Warehouse b) Data Marts
   c) Data Mining d) Metadata

2) Cluster is _____.
   a) Group of similar objects that differ significantly from other objects
   b) Operations on a database to transform or simplify data in order to prepare it for a machine learning algorithm
   c) Symbolic representation of facts or ideas from which information can potentially be extracted
   d) None of these

3) Attribute selection measures are also known as _____ because they determine how the tuples at a given node are to be split.
   a) unique rule b) splitting rules
   c) alternative rule d) primary rule

4) A _____ classifier uses a set of IF-THEN rules for classification.
   a) knowledge-based b) template-based
   c) model-based d) rule-based

5) A _____ is a set of views over operational databases.
   a) Enterprise warehouse b) Data Mart
   c) Virtual warehouse d) Refresh

6) _____, which converts data from legacy or host format to warehouse format.
   a) Refresh Data b) Data Transformation
   c) Data Cleaning d) Data Extraction

7) Concept hierarchy is a powerful form of _____.
   a) Background Knowledge b) Kinds of Knowledge
   c) Task Relevant data d) Interestingness measure

8) The class label of each training tuple is provided, this step is known as _____.
   a) unsupervised learning b) self learning
   c) supervised learning d) none of these

9) DIANA stands for _____.
   a) Divisive And Not Applicable
   b) Divisive ANAlysis
   c) Distinct ANAlysis
   d) Digital Analysis

10) Association rules that satisfy both the minimum confidence and support threshold are referred to as _____.
   a) Strong association rules
   b) Weak association rule
   c) General Association Rule
   d) None of these

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

1) In smoothing by bin means, each value in a bin is replaced by the mean value of the bin.
2) Data cleaning obtains a reduced representation of the data set that is much smaller in volume.
3) The top tier is front-end client layer, which contains query and reporting tools, analysis tools, and/or data mining tools.
4) Roll-up operation performs aggregation on a data cube, either by climbing up a concept hierarchy for a dimension or by dimension reduction.
5) Data mart is a set of views over operational databases.
6) Star schema, in which the data warehouse contains a large central table (Fact table).

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

a) Explain various applications of association rules.
b) Explain set-grouping hierarchies with suitable example.
c) What is Data Integration? Explain in short.
d) Explain typical OLAP operations with example.

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

a) What is data cube? Explain different schemas for multidimensional model.
b) Explain the procedure of Apriori algorithm with example.

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

a) What is classification? Explain different issues regarding with classifications.

b) What is cluster analysis? Explain various typical requirements of clustering in data mining.

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

a) Explain k-means algorithm with suitable example.

b) Explain Bayesian classification algorithm with suitable example.

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

a) What is data mining? Explain various data mining primitives with example.

b) Describe Data warehouse architecture with well labelled diagram.

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

a) Explain various applications of Data Mining.

b) What is Data Science? Explain the difference between Data Analytics and Data Science.

Seat No.	

Set **P**

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April - 2026
Open-Source Technologies (PHP, MySQL) (MCA01309)

Day & Date: Wednesday, 29-04-2026 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) How do you create an object (instantiate a class) in PHP?
   a) $obj = new ClassName; b) $obj = ClassName();
   c) $obj = create ClassName; d) ClassName $obj;

2) Which symbol must precede a variable name in PHP?
   a) ! b) $
   c) & d) #

3) What is the purpose of the strlen() function in PHP?
   a) To convert a string to lowercase
   b) To count the number of characters in a string
   c) To reverse a string
   d) To search for a substring within a string

4) Which keyword is used to manually trigger an exception in PHP?
   a) catch b) try
   c) throw d) finally

5) Which function is used to start a new session or resume an existing one in PHP?
   a) session_start() b) session_create()
   c) session_init() d) start_session()

6) Which PHP function is used to establish a connection with a MySQL server using the improved MySQL extension?
   a) mysql_connect() b) mysqli_connect()
   c) pdo_connect() d) connect_mysql()

7) Which of the following is a primary advantage of PHP regarding its cost?
   a) It requires expensive licenses.
   b) It is a proprietary language with a subscription fee.
   c) It is open-source and free to use.
   d) It is only free for personal projects.

8) Which of the following is primarily a server-side scripting language?
   a) JavaScript b) HTML
   c) CSS d) PHP

9) Which two predefined variables are commonly used to retrieve information from HTML forms submitted with different methods?
   a) $_GET & $_SET b) $_GET & $_POST
   c) $__GET & $__SET d) $_REQUEST & $_SESSION

10) How to define a function in PHP?
   a) functionName(parameters) {function body}
   b) function {function body}
   c) function functionName(parameters) {function body}
   d) data type functionName(parameters) {function body}

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

1) PHP is a client-side scripting language.
2) In PHP, null === false evaluates to true.
3) A 'switch' statement can use strings as case values in PHP.
4) PHP arrays can store different types of values (int, string, object, etc.) in the same array.
5) The 'Exception' class is the base class for all exceptions in PHP.
6) A PHP class can contain properties and methods.

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

a) Differentiate between Server-side Scripting and Client-side Scripting.

b) Explain PHP file reading function with example.

c) Explain different type casting functions in PHP.

d) What is Multidimensional array? Explain with example.

Q.3 Answer the following.

a) What are different parameter passing techniques used in PHP? Explain with example. **08**

b) What is exception handling? Explain how to catch and handle different types of exceptions efficiently in a PHP with examples. **08**

Q.4 Answer the following.

a) Explain different types of operators in PHP with suitable examples. **08**

b) What is inheritance and its types? Explain any three types with example. **08**

Q.5 Answer the following.

a) Explain different Branching statements in PHP with example. **08**

b) Explain any three PHP functions used with MySQL connections with example. **08**

Q.6 Answer the following.

a) What are different ways to create arrays? Write script to read and display multidimensional array. **08**

b) Write PHP script to insert, delete and update records. **08**

Q.7 Answer the following.

a) What are advantages and disadvantages of PHP? **08**

b) Explain Joomla framework. Explain different steps to develop website. **08**