SLR-RI-1

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2023
Object Oriented Programming Using C ++ (MCA101)

Day & Date: Monday, 10-07-2023 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. No. 3 to Q. No. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose Correct Alternative. **10**

1) What is Inheritance in C++?
   a) Wrapping of data into a single class
   b) Deriving new classes from existing classes
   c) Overloading of classes
   d) Classes with same names

2) What is a copy constructor?
   a) A constructor that allows a user to move data from one object to another
   b) A constructor to initialize an object with the values of another object
   c) A constructor to check the whether to objects are equal or not
   d) A constructor to kill other copies of a given object.

3) Identify Ae correct syntax for declaring arrays in C++.
   a) array arr [10] b) array [10]
   c) int arr [10] d) int arr

4) The programming language that has the ability to create new data types is called_____
   a) Overloaded b) Encapsulated
   c) Reprehensible d) Extensible

5) C++ is a _____ type of language.
   a) High-level Language b) Low-level language
   c) Middle-level language d) None of the above

6) Which type of function among the following shows polymorphism?
   a) Inline function b) Virtual function
   c) Undefined functions d) Class member functions

7) Which feature can be implemented using encapsulation?
   a) Inheritance b) Abstraction
   c) Polymorphism d) Overloading

8) Which keyword is used to throw an exception?
   a) Try b) throw
   c) Throws d) except

9) What is the effect of writing a break statement inside a loop?
   a) It cancels remaining iterations
   b) It skips a particular iteration.
   c) The program terminates immediately.
   d) Loop counter is reset.

10) When does the void pointer can be dereferenced?
   a) When it doesn't point to any value
   b) When it cast to another type of object
   c) Using delete keyword
   d) None of the mentioned

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

1) Super classes are also called Parent classes/Base classes.
2) We can use this pointer in static member function of the class.
3) An object is an instance of its class.
4) Pure virtual function has no implementation in the base class whereas virtual function may have an implementation in the base class.
5) An exception is caused by a problem in the operating system.
6) An array is a series of elements of the same type placed in non-contiguous memory locations.

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

a) Explain default argument to a function.
b) Write a short note on basic stream classes.
c) Explain parameterized constructor with example.
d) Describe pointer to objects.

Q.3 Answer the following.

a) Write an object oriented program in C++ that prints the factorial of given number. **08**
b) What is virtual function? Explain the rules for virtual functions. **08**

Q.4 Answer the following

a) Define algorithm and flowchart? Explain the use of basic symbols used in flowchart. **08**
b) What is meant by inheritance? Explain multiple inheritance with example. **08**

Q.5 Answer the following

a) Explain exception handling mechanism with example. **08**
b) Write a program in C++ to check whether entered number is Armstrong or not. **08**

Q.6 Answer the following

a) Define polymorphism. How polymorphism is achieved at compile time and run time. **08**
b) What is template? Explain function template with example. **08**

Q.7 Answer the following

a) What are the characteristics of constructor function? Explain copy constructor. **08**
b) What is difference between procedure oriented programming and object oriented programming. **08**

SLR-RI-2

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2023
Data Structures (MCA102)

Day & Date: Wednesday, 12-07-2023 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) Multiple choice questions. **10**

1) The process of arranging data in alphabetical or numerical order is called _____.
   a) Sorting b) Searching
   c) Traversal d) Merging

2) The address of the first element of an array is called _____.
   a) First Address b) Base Address
   c) Initial Address d) Location Address

3) _____ is very useful in situation when data have to stored and then retrieved in reverse order.
   a) Link list b) Queue
   c) List d) Stack

4) What is a full binary tree?
   a) Each node has exactly zero or two children
   b) Each node has exactly two children
   c) All the leaves are at the same level
   d) Each node has exactly one or two children

5) Heap can be used as _____.
   a) Priority queue b) Stack
   c) A decreasing order array d) Normal Array

6) Which of the following is not an advantage of a priority queue?
   a) Easy to implement
   b) Processes with different priority can be efficiently handled
   c) Applications with differing requirements
   d) Easy to delete elements in any case

7) What is the traversal strategy used in the binary tree?
   a) depth-first traversal b) breadth-first traversal
   c) random traversal D) Priority traversal

8) How do you initialize an array in C?
   a) int arr[3] = (1,2,3); b) int arr(3) = {1,2,3};
   c) int arr[3] = {1,2,3 }; d) int arr(3) = (1,2,3);

9) In general, the index of the first element in an array is _____.
   a) 0 b) -1
   c) 2 d) 1

10) The prefix form of A-B/ (C * D ^ E) is?
   a) -/*^ACBDE b) -ABCD*^DE
   c) -A/B*C^DE d) -A/BC*^DE

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

1) All leaf nodes are called internal nodes.
2) Binary search is used for searching in a sorted array.
3) In the infix form, the operator precedes the two operands.
4) The stack operated in First in first out.
5) General ordered tree can be encoded into binary trees.
6) To restore the AVL property after inserting a element, we start at the insertion point and move towards root of that tree

Q.2 Answer the following **16**

a) Define and explain the following terms:
(i) Data (ii) Data structure (iii) Algorithm (iv) Information
b) Explain Non-primitive data types.
c) Explain the divide and conquer strategy with suitable example.
d) Explain Circular Queues.

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

a) Explain Primitives and composite data types with examples.
b) What is array? Explain one dimensional array with example.

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

a) Explain linked list with their operations.
b) What is AVL tree? Give an example of it.

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

a) What is Algorithm? Explain properties of Algorithm.
b) Explain traversing of binary tree.

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

a) What is searching algorithm? Explain their complexity.
b) Write a program in C to implement stack data structure.

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

a) What do you mean by sorting? Perform Bubble sort on following series.
Series: 33, 45, 12, 42, 94, 28, 03, 57,35, 99 and 18
b) Differentiate between Stack and Queue

SLR-RI-3

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2023
Software Engineering (MCA103)

Day & Date: Friday, 14-07-2023 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) _____ is an indirect measure of software development process.
   a) Cost b) Effort Applied
   c) Efficiency d) All of the above

2) _____ Specification is also known as SRS document.
   a) White box b) Grey-box
   c) Black box d) None of the above

3) Which one of the following is not a software process quality?
   a) Visibility b) Timeliness
   c) Productivity d) Portability

4) _____ originally proposed the spiral model.
   a) Pressman b) Royce
   c) IBM d) Barry Boehm

5) We generally use _____ for software maintenance.
   a) Integration testing b) unit testing
   c) System testing d) Regression testing

6) Code is checked in which type of testing?
   a) White box testing
   b) Black box testing
   c) Green box testing
   d) Red box testing

7) What is the first step in software devlopment life cycle?
   a) System design
   b) Coding
   c) system testing
   d) preliminary investigation & analysis

8) What does RAD stands for?
   a) Rapid Application Development
   b) Relative Application Development
   c) Rapid Application Document
   d) None of the above

9) Which of the following does not relate to evolutionary process model.
   a) Incremental model b) Concurrent development model
   c) WINWIN spiral model d) All of the above

10) By whom is unit testing done?
   a) Users
   b) Customers
   c) Developers
   d) None of the above

B) Fill in the blank. **06**

1) Software is process and _____.
2) In waterfall model the phases involved in the software development are organized in _____.
3) Structured analysis mainly depends on data flow diagrams and _____.
4) In object oriented design the modules in the design represent _____.
5) _____ tools helps in code creation, debugging and testing.
6) _____ is also known as functional testing.

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

a) What is Evolutionary software process model? Explain in brief.
b) What are specification languages?
c) Why design phase is important in software development life cycle?
d) Explain the testing objectives & testing principle.

Q.3 Answer the following.

a) Define software engineering. Explain waterfall model. **08**
b) What are the principles of requirement analysis? **08**

Q.4 Answer the following.

a) Explain white box testing and black box testing in detail. **08**
b) What is software design? Describe the difference between conceptual design and technical design? **08**

Q.5 Answer the following.

a) Define software metrics. Why do we really need metrics in software. **08**
b) Explain how we can perform object oriented analysis and design **08**

Q.6 Answer the following.

a) Differentiate functional requirement and nonfunctional requirement. **08**
b) What is meant by software quality assurance? Explain MC CALL'S software quality model in detail. **08**

Q.7 Answer the following.

a) Explain a layered technology of software engineering. **08**
b) How are software myths affecting software process? Explain with the suitable example. **08**

SLR-RI-4

Seat No.	

Set P

M.C.A. (Semester- I) (New) (CBCS) Examination: March/April-2023
Operating System (MCA104)

Day & Date: Sunday, 16-07-2023 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 alternative (MCQ). **10**

1) The Shortest Job First (SJF) algorithm executes _____.
   a) that last entered the queue
   b) with the least processor needs
   c) that has been in the queue the longest
   d) that first entered the queue

2) _____ is an operating system.
   a) collection of programs that manages hardware resources
   b) system service provider to the application programs
   c) interface between the hardware and application programs
   d) all of the mentioned

3) Deadlock prevention is _____.
   a) to ensure that at least one of the necessary conditions cannot hold
   b) to ensure that all of the necessary conditions do not hold
   c) to decide if the requested resources for a process have to be given or not
   d) to recover from a deadlock

4) _____ is the total time taken from the submission time till the first response is produced.
   a) Response time b) Access time
   c) Waiting time d) Turnaround time

5) _____ uses the arrival of a message causes the system to create a new thread to handle the message.
   a) Scheduler activation b) Hybrid thread
   c) Pop-up thread d) none of these

6) A _____ defines a path from the current directory.
   a) Absolute path b) Directory path
   c) Relative path d) File-Directory path

7) Paging involves breaking physical memory into fixed sized called _____.
   a) Segments b) Fragments
   c) Pages d) Frames

8) Paging _____.
   a) solves the memory fragmentation problem
   b) allows modular programming
   c) allows structural programming
   d) avoids deadlock

9) Loading the pages before letting processes run is also called _____.
   a) Paging b) pre-paging
   c) swapping d) Segmentation

10) Thrashing occurs if _____.
   a) it has no memory allocated to it
   b) it spends a lot of time executing, rather than paging
   c) it spends a lot of time paging than executing
   d) none of the mentioned

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

1) A user-level process cannot modify its own page table entries.
2) The difference between a computer Worm and a computer Virus is that a Virus requires human action to spread.
3) The rate of page faults in a virtual memory system can always be reduced by adding more memory.
4) Using mutual exclusion ensures that a system avoids deadlock.
5) Round robin scheduling provides a latency improvement over FCFS scheduling for interactive jobs.
6) Run time mapping from virtual to physical address is done by Memory management Unit.

Q.2 Write Short Note on. **16**

a) Virtual Memory
b) Paging
c) Mutual Exclusion
d) System Call

Q.3 Answer the following.

a) What is operating system? Explain different functions of an operating system. **08**
b) What is Thread and explain in detail? **08**

Q.4 Answer the following.

a) Explain monolithic system and layered system structure of an operating system in detail. **08**
b) What is deadlock? Explain deadlock avoidance technique with example. **08**

Q.5 Answer the following.

a) Explain swapping and memory management with bitmaps in detail. **08**
b) What is a directory? Explain single level and hierarchical directory system in detail. **08**

Q.6 Answer the following.

a) Explain segmentation in detail. **08**
b) Explain different file types in detail. **08**

Q.7 Answer the following.

a) What is a process? Explain different states of a process. **08**
b) What is scheduling? Explain FCFS and Round Robin algorithm in detail. **08**

SLR-RI-5

Seat No.	

Set P

MCA (Semester- I) (New) (CBCS) Examination: March/April-2023
Digital Circuits and Microprocessors (MCA105)

Day & Date: Tuesday, 18-07-2023 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 alternative. **10**

1) DMA stands for _____.
   a) Direct memory access b) Direct memory allocation
   c) Data memory access d) Data memory allocation

2) MSD stands for _____.
   a) Least significant digit b) Most significant digit
   c) Medium significant digit d) low significant digit

3) The term gigabyte refers to _____.
   a) 1024 bytes b) 1024 kilobytes
   c) 1024 megabytes d) 1024 gigabyte

4) An error in computer data is called _____.
   a) Chip b) Bug
   c) CPU d) Storage device

5) The central processing unit _____
   a) is operated from the control panel
   b) controls all input, output and processing
   c) is controlled by input data as it enters the system
   d) is controlled by auxiliary storage unit

6) A full adder can be made out of _____.
   a) two half adders
   b) two half adders and a OR gate
   c) two half adders and a NOT gate
   d) three half adders

7) In a multiplexer the output depends on its _____.
   a) Data inputs b) Select inputs
   c) Select outputs d) Enable pin

8) The output of a half adder is _____.
   a) Sum b) Sum and Carry
   c) Carry d) none of these

9) Multiplexer means _____.
   a) Many in to One b) Many in to Many
   c) One in to Many d) None of the Above

10) In Adder, the output of CARRY is equal to output of _____.
   a) AND gate b) OR gate
   c) NOT gate d) NOR gate

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

1) The operation 1 + 0 = 1.
2) An OR gate has 4 inputs. One input is high and the other three are low. The output is alternately high and low.
3) A half subtractor circuit has 2 i/p & 2 o/p.
4) The NOT gate is also called inverter.
5) BCD stands for binary-coded decimal.
6) A combinational circuit which is used to send data coming from a single source to two or more separate destinations is called as Demultiplexer.

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

a) What is BIU?
b) What is mean by Binary Logic?
c) What is VLSI?
d) What is Dem organs' Law?

Q.3 Answer the following.

a) What is half adder? Explain its working with suitable example. **08**
b) Discuss in detail architecture of 8086 Microprocessor. **08**

Q.4 Answer the following.

a) Define Multiplexer. Explain its various types with neat diagram. **08**
b) Discuss in detail addressing modes of 8086 Microprocessor. **08**

Q.5 Answer the following.

a) State and explain in detail D Flip Flop? **08**
b) What are various instruction set of Microprocessor operations. **08**

Q.6 Answer the following.

a) What do you mean by Universal Gates? Explain in detail truth table of Universal gates. **08**
b) What is registers? Explain in detail shift register with suitable example. **08**

Q.7 Answer the following.

a) Define Basic and derived gates. Explain truth tables of these gates with neat diagram. **08**
b) Define K-Map? Explain the k-map simplification method for the following Boolean function:- **08**

$$F(x, y, z) = \Sigma(1,3,5,7)$$

SLR-RI-6

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2023
Discrete Mathematical Structures (MCA109)

Day & Date: Thursday, 20-07-2023 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) If a finite set S has n elements, then the power set of S has _____ elements.
   a) 2^n b) $2n$
   c) 2^n d) $2 + n$

2) If A and B be two sets then _____.
   a) $A \cup B = \{x: x \notin A \text{ and } x \in B]$
   b) $A \cup B = \{x: x \in A \text{ and } x \notin B]$
   c) $A \cap B = \{x: x \in A \text{ and } x \in B]$
   d) $A \cap B = \{x: x \in A \text{ or } x \in B]$

3) If any five integers from 1 to 8 are chosen, then at least two of them will have a sum _____
   a) 9 b) 11
   c) 12 d) 10

4) In any graph G, the number of vertices of odd degree is always _____
   a) prime b) even
   c) odd d) composite

5) The generating function of the sequence 0, 1, 2, 3, … is
   a) $\sum_{k=0}^{\infty} x^k$ b) $\sum_{k=0}^{\infty}(k+1).x^k$
   c) $\sum_{k=0}^{\infty} k.x^{-k}$ d) $\sum_{k=0}^{\infty} k.x^k$

6) Which of the following is a subset of set $\{1, 2, 3, 4\}$?
   a) {1,2} b) {1,2,3}
   c) {1} d) All of these

7) A function $f: A \to B$ is said to be _____ function if each element of B is the image of some element of A.
   a) one to one b) onto
   c) into d) many one

8) The characteristic equation of the matrix $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ is _____
   a) $\lambda^3 + 12\lambda^2 + 36\lambda + 32 = 0$
   b) $\lambda^3 - 12\lambda^2 + 36\lambda - 32 = 0$
   c) $\lambda^3 - 12\lambda^2 + 32\lambda + 36 = 0$
   d) $\lambda^3 - \lambda^2 + 36\lambda - 32 = 0$

9) If p is true and q is false then _____.
   a) $p \wedge q$ is true b) $p \vee q$ is true
   c) $p \vee q$ is false d) None of these

10) Which of the following proposition is true?
   a) $p \wedge q \equiv p \vee q$ b) $p \wedge T \equiv F$
   c) $(p \vee q)vr \equiv p \vee (q \wedge r)$ d) $p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$

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

1) A statement pattern whose truth value is true for all possible combinations of truth values of its prime components is called a _____.
2) If $G = \{1, -1, i, -i\}$ be a multiplicative Group then order of element $-i$ is _____
3) $If\ n_{C_x} = 56$ and $n_{P_x} = 336$ then $x = ?$
4) A function $f: A \to B$ is called a _____ function if the same element $b \in B$ is assigned to every element in A.
5) For two invertible matrices A and B of suitable orders, the value of $(AB)^{-1}$ is _____.
6) If no two distinct elements of a Poset are comparable then it is called _____.

Q.2 Answer the following.

a) Prove that the total degree of graph G is twice the number of edges in graph G. **04**

b) Write a note on Planar and Hamiltonian Graph. **04**

c) Prove that Z_5 is a group with respect to binary operation addition. **04**

d) If matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then find adjoint of A. **04**

Q.3 Answer the following.

a) Find the inverse of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 4 \\ 1 & 4 & 3 \end{bmatrix}$ **08**

b) Solve the system of equation by matrix method **08**

$x - y + z = 4$
$2x + y - 3z = 0$
$x + y + z = 2$

Q.4 Answer the following.

a) If $(L, \precsim)$ be a lattice then for any $a, b, c, d \in L$ Show that, **08**

i) $a \precsim b \Rightarrow a \vee c \precsim b \vee c$
ii) $a \precsim b \Rightarrow a \wedge c \precsim b \wedge c$
iii) $a \precsim b$ and $c \precsim d \Rightarrow a \vee c \precsim b \vee d$
iv) $a \precsim b$ and $c \precsim d \Rightarrow a \wedge c \precsim b \wedge d$

b) Construct the truth table for each of the following statement patterns. **08**

i) $\sim(\sim p \wedge \sim q) \vee q$
ii) $[(p \wedge q) \vee r] \wedge [\sim r \vee (p \wedge q)]$

Q.5 Answer the following.

a) Define the following terms with examples: **08**

1) Walk
2) Open and closed walk
3) Trail
4) Path
5) Cycle

b) Define Hasse diagram and Draw the Hasse diagram of the poset $(P(S), \subseteq)$ where $P(S)$ is the power set on $S = \{a, b\}$ **08**

Q.6 Answer the following.

a) If A, B and C are any three sets then show that, **10**

1) $A \cup (B \cup C) = (A \cup B) \cup C$
2) $A \cap (B \cap C) = (A \cap B) \cap C$
3) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
4) $(A \cup B)' = A' \cap B'$

b) Using truth table prove that **06**

1) $(p \wedge q) \equiv \sim (p \rightarrow \sim q)$
2) $(p \wedge q) \rightarrow r \equiv p \rightarrow (q \rightarrow r)$

Q.7 Answer the following.

a) Show that every square matrix A can be expressed as a sum of a symmetric and skew symmetric matrix. **08**

b) Explain the following terms with examples. **08**

1) Subset
2) Proper set
3) Power set
4) Disjoint sets

SLR-RI-8

Seat No.	

Set P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April-2023
Java Programming (MCA201)

Day & Date: Tuesday, 11-07-2023 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) Choose correct alternatives **10**

1) Java is designed for _____ environment of the Internet.
   a) Development b) Deduction
   c) Distributed d) Web Design

2) System.in.read() is being used, the program must specify _____ the clause.
   a) throws.java.out.IOException
   b) throws.java.in.IOException
   c) throws.java.io.IOException
   d) throws.java.io.InException

3) In Java programming _____ tool is used for automatic generation of documentation.
   a) Java commenting b) Java generator
   c) Java doc d) Java loc

4) Prepared Statement Object in JDBC is used to execute _____ queries.
   a) Executable b) Simple
   c) high level d) parameterized

5) What would happen if “String[] args” is not included as an argument in the main method?
   a) No error b) Compilation error
   c) The program won’t run d) Program exit

6) Which of the following is not mandatory in a variable declaration?
   a) Semicolon b) an identifier
   c) an assignment d) a data type

7) Who invented Java language?
   a) Dennis Ritchie b) James Gosling
   c) Larry Page d) Serge Page

8) Inner classes are
   a) anonymous classes b) nested classes
   c) subclasses d) derived classes

9) How many times does the following code segment execute
```
int x=1, y= 10, z=1;
do{y-; x++; y-=2; y=z; z++}
while (y>l && z<l0);
```
   a) 1 b) 10
   c) 5 d) infinite

10) For the execution of DELETE SQL query in JDBC_____ method must be used.
   a) executeQuery() b) executeDeleteQuery()
   c) executeUpdate() d) executeDelete()

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

1) Consider an expression m%n where m and n are int type variables and m=5 and n=2. Then the result will be 1.
2) If a variable is declared final, it must include initial value.
3) It is an important feature of java that it always provides a default constructor to a class.
4) An integer expression are valid for an if statement.
5) In Java, a string is a primitive data type.
6) Methods can be overloaded with a difference only in the type of the return value.

Q.2 Answer the following **16**

a) Types of variable
b) Primitive and Non-Primitive Datatypes
c) Multi-dimensional Array
d) Packages and interfaces

Q.3 Answer the following

a) Define Inheritance. Explain types of inheritance with example. **08**
b) Explain method Overloading with example. **08**

Q.4 Answer the following: -

a) Differentiate for loop vs while loop vs do-while loop in java. **08**
b) Write a program to create a thread by implementing Runnable interface. **08**

Q.5 Answer the following: -

a) What is Custom Exception with example. **08**
b) Explain Character Stream and Byte Stream with example. **08**

Q.6 Answer the following: -

a) What are the types of Events in Delegation Model? Explain. **08**
b) Write a java program to demonstrate the use of init() method and start() method. **08**

Q.7 Answer the following: -

a) Define Class and Object. Write a Java Program to demonstrate the working of a banking-system where we deposit and withdraw amount from our account. Creating an Account class which has deposit() and withdraw() methods. **08**
b) How to create and execute the SQL statements in java? Explain with example. **08**

SLR-RI-9

Seat No.	

Set P

M.C.A. (Semester-II) (New) (CBCS) Examination: March/April-2023
Advanced DBMS (MCA202)

Day & Date: Thursday, 13-07-2023 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) Choose correct alternative. (MCQ) **10**

1) Which of the following is not a type of database?
   a) Hierarchical b) Network
   c) Distributed d) Decentralized

2) Which of the following command is correct to delete the values in the relation stud?
   a) Delete from stud;
   b) Delete from stud where Id =’Null’;
   c) Remove table stud;
   d) Drop table stud;

3) Which of the following is the subset of SQL commands used to manipulate Structures or Schema of tables?
   a) Data Described Language
   b) Data Retrieval Language
   c) Data Manipulation Language
   d) Data Definition Language

4) Which of the following refers to the number of tuples in a relation?
   a) Entity b) Column
   c) Cardinality d) None of the above

5) 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

6) A _____ consists of a sequence of query and/or update statements.
   a) Transaction b) Commit
   c) Rollback d) Flashback

7) The log is a sequence of _____ recording all the update activities in the database.
   a) Log records b) Records
   c) Entries d) Redo

8) How many join types in join condition?
   a) 2 b) 3
   c) 4 d) 5

9) Which of the following is used to denote the selection operation in relational algebra?
   a) Pi b) Sigma
   c) Lambda d) Omega

10) Which of the following is an attribute that can uniquely identify a row in a table?
   a) Secondary key b) Candidate key
   c) Foreign key d) Alternate key

B) Write true/false **06**

1) Information is processed data.
2) Isolation ensures that the database properly changes states upon a successfully committed transaction.
3) Table is the basic data storage unit in a Relational database.
4) Triggers cannot operate on insertion, deletion, and updates.
5) MODIFY TABLE is one of the data definition language commands in SQL.
6) Transaction has 5 numbers of steps.

Q.2 Answer the following

a) What is an instance? What is a schema? **04**

b) Explain commands with respect to SQL: **04**
   i) Rename
   ii) Alter

c) List and explain different database users. **04**

d) What is abstract data type? give suitable example. **04**

Q.3 Answer the following.

a) List and explain various data models used for database design. **08**

b) What is transaction? Explain ACID properties of transaction **08**

Q.4 Answer the following.

a) What is functional dependency? Explain its usage in database design. **08**

b) What is normalization? Explain 3NF & 4NF. **08**

Q.5 Answer the following.

a) What is Join? Explain different types of Join. **08**

b) Explain life cycle of Database System Development. **08**

Q.6 Answer the following.

a) What is DBMS? Explain advantages of DBMS. **08**

b) What is database recovery? Explain any two techniques for database recovery. **08**

Q.7 Answer the following.

a) What is trigger? Give appropriate example to show use trigger. **08**

b) What is distributed database? Explain types of distributed database **08**

SLR-RI-10

Seat No.	

Set P

M.C.A. (Semester - II) (CBCS) Examination: March/April-2023
Computer Communication Network (MCA203)

Day & Date: Saturday, 15-07-2023 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) Choose correct alternatives **10**

1) ICMP stands for _____.
   a) Internet Control Message Particle
   b) Internet Control Message Point
   c) Internet Control Message Protocol
   d) None of the above

2) _____ of the following is a static routing algorithm.
   a) Shortest path routing b) Link state routing
   c) Distance vector routing d) None of the above

3) The TCP and UDP are the common protocols and technologies in _____ Layer.
   a) Network b) Transport
   c) Session d) None of the above

4) The DNS, NFS, and BOOTP are the common protocols and technologies in _____ layer.
   a) Physical b) Transport
   c) Data Link d) Application

5) _____ is the protocol primarily used for browsing data.
   a) HTTP b) FTP
   c) TCP d) TFTP

6) _____ is the collection of the hyperlinked document on the internet.
   a) HTML b) e-mail
   c) WWW d) None of these

7) _____ is the length of the IPv4 address.
   a) 8 bits b) 16 bits
   c) 32 bits d) 128 bits

8) The arrangement where all data pass through a central computer is known as _____.
   a) Ring topology b) Star topology
   c) Mesh topology d) Bus topology

9) Identify among the _____ which belongs to class A.
   a) 121.12.12.248 b) 128.12.12.248
   c) 129.12.12.248 d) 130.12.12.248

10) _____ of the following device is used to connect two systems, especially if the systems use different protocols.
a) Repeater b) Gateway
c) Bridge d) Hub

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

1) In a peer-to-peer network, any client computer can also be a server.
2) The Network layer is concerned with the controlling of operation of the subnet.
3) Modem is a hardware device which provides a connection between the computer and the transmission media.
4) ICMP reports on the success or failure of data delivery.
5) IMAP4 servers require less storage space and usually more processing resources than POP servers do.
6) HTTP is a markup language.

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

a) LAN
b) DNS
c) Static web document
d) Internetwork

Q.3 Answer the following.

a) Explain connection oriented and connectionless service primitives in detail? **08**
b) Explain Routing algorithm in detail? **08**

Q.4 Answer the following.

a) Explain OSI reference model? **08**
b) Explain how network can be connected (Network Connection) with each other in detail? **08**

Q.5 Answer the following.

a) Explain Tunneling mechanism in detail? **08**
b) Explain ICMP in detail? **08**

Q.6 Answer the following.

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

Q.7 Answer the following.

a) Explain Flow-Control and Buffering mechanism in transport layer? **08**
b) Explain architecture and services of Electronic mail (e-mail) in detail? **08**

SLR-RI-11

Seat No.	

Set P

MCA (Semester-II) (New) (CBCS) Examination: March/April-2023
System Software (MCA204)

Day & Date: Monday, 17-07-2023 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) Choose correct alternative. **10**

1) Assembler is a program that _____.
   a) Places programs into memory and prepares them for execution.
   b) Automates the translation of assembly language into machine language.
   c) accepts a program written in a high level language and produces an object program.
   d) None of these.

2) Input of Lex is _____.
   a) Set to regular expression b) Statement
   c) Numeric data d) ASCII data

3) A processor _____.
   a) Is a sequence of instructions
   b) Is the device where information is stored
   c) Is a device that performs a sequence of operations specified by instructions in memory
   d) None of these

4) The translator used by second generation languages is _____.
   a) Assembler b) Interpreter
   c) Compiler d) Linker

5) Loading Operating system is the task of _____.
   a) loader Absolute loader b) Linking loader
   c) Bootstrap d) None of these

6) A linkage editor produces a _____ version of the program.
   a) Complied b) Modified
   c) Interpreted d) Linked

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

8) Which of the following file is an output of the assembler?
   a) Program file b) Object file
   c) Data File d) Task File

9) In which parsing, the parser constructs the parse tree from the start symbol and transforms it into the input symbol.
   a) Bottom-up parsing b) Top-down parsing
   c) None of the above d) Both a and b

10) Which of the following is not a type of assembler?
a) One pass b) Two pass
c) Three pass d) Load and go

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

1) Cray 3TE are CISC machines.
2) Macro processors are machine independent.
3) A linker is an important utility program that takes the object files, convert them into a single executable file.
4) The loader is Software that converts an assembly language code to machine code.
5) A compiler is a special program that translates a programming language's source code into machine code.
6) Vax are CISC machines.

Q.2 Write Short Notes on **16**

a) Linkage editor
b) Absolute loader
c) Basic Compiler functions
d) Program relocation

Q.3 Answer the following.

a) Explain UltraSPARC architecture for RISC machine. **08**
b) What is Macro? Explain types of Macro. **08**

Q.4 Answer the following.

a) Explain machine-independent features of compiler. **08**
b) Explain different types of loader in detail. **08**

Q.5 Answer the following.

a) Explain one pass assembler and two pass assembler. **08**
b) Explain RISC and CISC processor in details. **08**

Q.6 Answer the following.

a) What are Literals? Differentiate literals from immediate operands. **08**
b) Explain machine independent features of loader. **08**

Q.7 Answer the following.

a) What is parsing? Explain top-down and bottom-up parsing. **08**
b) What is macro preprocessing? Design algorithm for one macro preprocessor. **08**

SLR-RI-12

Seat No.	

Set P

M.C.A. (Sem - II) (New) (CBCS) Examination: March/April-2023
UML (MCA207)

Day & Date: Wednesday, 19-07-2023 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) Choose correct alternatives. **10**

1) What is collection of model elements called?
   a) Box b) Dependency
   c) UML Packages d) Package members

2) An object symbol is divided into what parts?
   a) Top compartment b) Bottom compartment
   c) All of the above d) None of these

3) Which things are dynamic parts of UML models?
   a) Structural things b) Behavioral things
   c) Grouping things d) Annotational things

4) What is the programming style of the object oriented conceptual model?
   a) Invariant relationships
   b) Algorithms
   c) Classes and Objects
   d) Goal often expressed in a predicate calculus

5) Which of the following is grouping thing?
   a) Class b) Package
   c) Use case d) Collaboration

6) An interface is rendered as _____.
   a) Cube b) Square
   c) Rectangle d) Circle

7) A query operation on a object _____.
   a) has no side effect
   b) has side effect
   c) changes the state of an object
   d) is not allowed

8) What is an interaction diagram?
   a) Interaction diagram are the UML notations for dynamic modeling of collaborations
   b) Interaction diagram are a central focus of engineering design
   c) All of the above
   d) None of the above

9) SDLC stands for _____.
   a) Software Design Life Cycle
   b) Software Development Last Cycle
   c) Software Development Life Cycle
   d) None of these

10) If you are working on real time process control applications or systems that involve concurrent processing, you would use a _____.
a) Activity diagram b) Sequence diagram
c) State chart diagram d) Object diagram

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

1) Artifacts instances and types have same names.
2) A dependency relation holds between two entities D and I where change in I does not affect D.
3) A property is a characteristics of the entity designated by a model element.
4) The main way to extend UML is by constraints, properties etc.
5) Use case diagram is a dynamic model of interaction between product and actors in a use case.
6) Object diagram captures the behavior of a single use case.

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

a) What is template class? How it is represented in UML?
b) Explain state machines.
c) What is component and what are different kinds of components?
d) What is the meaning of abstract, root, leaf and polymorphic elements?

Q.3 Answer the following.

a) Draw the class diagram and sequence diagram for online digital library system. **08**
b) Explain the terms and concepts used in deployment diagram. **08**

Q.4 Answer the following.

a) Explain the element of a class diagram with an example. **08**
b) Explain various notations used in UML. **08**

Q.5 Answer the following.

a) What are the advantages of UML? Explain the building blocks of UML. **08**
b) Explain aggregation and composition with the help of suitable example. **08**

Q.6 Answer the following.

a) Explain the importance of object oriented design modeling. **08**
b) Draw and explain the use case diagram for electricity bill payment system. **08**

Q.7 Answer the following.

a) Explain the terms and concepts used for modeling techniques in component diagram. **08**
b) What is package? How it is represented in UML? Describe importing and exporting of package. **08**

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Seat No.	

Set P

M.C.A. (Sem - II) (New) (CBCS) Examination: March/April-2023
Graph Theory (MCA208)

Day & Date: Wednesday,19-07-2023 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**

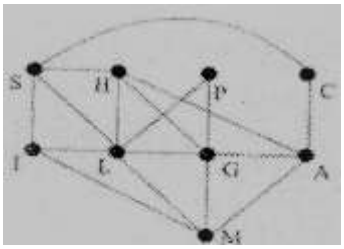
1) A _____ of a graph is an assignment of colours to the vertices of a graph such that adjacent vertices have different colours.
   a) vertex colouring b) edge colouring
   c) complete graph d) All of these

2) A graph has a Hamiltonian circuit if each vertex has degree _____.
   a) 0 b) ≥ 3
   c) ≥ 2 d) ≤ 3

3) If v is an articulation point and v is the root of the tree in DFS then v has more than _____ son.
   a) 1 b) 2
   c) 3 d) 4

4) The degree of V_i^{th} vertex is equal to the sum of the entries in _____ of adjacency matrix.
   a) i^{th} row b) i^{th} column
   c) both a and b are true d) i^{th} row and i^{th} column

5) What is the chromatic number of the given graph?



   a) 5 b) 4
   c) 6 d) 3

6) If G = (V, E) be any connected undirected edge-weighted graph. The weights of the edges in E are positive and distinct. Consider the following statements:
   I) Minimum Spanning Tree of G is always unique.
   II) Shortest path between any two vertices of G is always unique.
   Which of the above statements is/are necessarily true?
   a) Only I b) Only II
   c) Both I and II d) Neither I nor II

7) A given connected graph G is a Euler Graph if and only if all vertices of G are of _____ degree.
   a) even b) same
   c) odd d) different

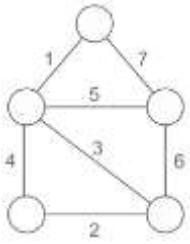
8) A graph with chromatic number less than or equal to k is called?
   a) K chromatic
   b) K colorable
   c) K chromatic colorable
   d) K colorable chromatic

9) If G be an undirected complete graph on n vertices, where n > 2. Then, the number of different Hamiltonian cycles in G is equal to _____.
   a) 1
   b) 2
   c) $(n-1)!$
   d) $\frac{(n-1)!}{2}$

10) Consider a connected multigraph with 8 vertices has an Euler circuit then which of the following degrees is possible for each vertex so that the graph has an Euler circuit?
   a) 3
   b) 5
   c) 7
   d) 4

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

1) A _____ is a graph in which no two edges cross each other.
2) What is the minimum cost spanning tree for the given graph?



3) If for every cut of a graph there is a unique light edge crossing the cut then the graph has a unique minimum _____.
4) If v is an articulation point and v is not the root of the tree in DFS spanning forest then v has a son v' such that _____
5) A Hamiltonian graph is one which contain a _____.
6) What will be the chromatic number for an empty graph having n vertices?

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

a) Define isomorphism of graph with two examples.
b) What are the dominating sets?
c) Write a note on adjacency matrix.
d) Give the basic properties of planar graph.

Q.3 Answer the following.

a) Discuss the following terms with examples: **08**
   i) Edge colouring ii) Vertex colouring
b) State and prove the four colour theorem. **08**

Q.4 Answer the following.

a) Define the following terms: **08**
   i) Maximum cardinality matching's ii) Perfect matching's
b) Explain minimum cost-flow algorithm. **08**

Q.5 Answer the following.

a) Explain Dijkstra's shortest path algorithm. **08**
b) Show that the number of vertices of odd degree in a finite graph is even. **08**

Q.6 Answer the following.

a) Define the following terms: **08**
i) Spanning tree ii) Circuits iii) Cut-sets iv) Connectivity

b) Explain the method of travelling salesman problem. **08**

Q.7 Answer the following.

a) Show that in a depth first search of a digraph, if (u,v) is a cross-edge then $DFI(u) > DFI(V)$ **08**

b) Write a note on fundamental cut-sets of a graph. **08**

SLR-RI-14

Seat No.	

Set P

MCA (Semester - III) (New) (CBCS) Examination: March/April-2023
.NET Technology (MCA301)

Day & Date: Monday, 10-07-2023 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) Choose the correct alternatives **10**

1) ASP .NET is used to create_____.
   a) Windows application b) Web application
   c) Consol application d) All the above

2) File extension used for ASP .NET files ____.
   a) .web b) .asp
   c) .aspx d) none of the above

3) Which of the following is not a namespace in the .NET Framework Class Library?
   a) System.Process b) System.Security
   c) System.Threading d) Systgem.xml

4) Which of the following is not an ASP.NET page event?
   a) Init b) Load
   c) Import d) None of the above

5) In ASP.NET application DLL files are stored in which folder?
   a) App_Code b) App_Data
   c) Bin d) App_LocalResources

6) The assembly and their resources information is stored in _____.
   a) MSIL b) Assembly manifest
   c) GAC d) Type metadata

7) Which of the following is correct about C#?
   a) It is component oriented.
   b) It can be compiled on a variety of computer platforms
   c) It is a part of .Net Framework.
   d) All of the above.

8) What class does the ASP.NET Web Form class inherit from by default?
   a) System.Web.UI.Page b) System.Web.UI.Form
   c) System.Web.GUI.Page d) System.Web.Form

9) Which is not a main component of the Visual Studio IDE?
   a) Start Menu b) Tool Box
   c) Designer Window d) Solution Explorer

10) To implement a specified .NET Framework interface which directive is used?
   a) @Register b) @ Control
   c) @ Reference d) @ Implements

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

1) Boolean is the data type return in IsPostback property.
2) UnLoad is first method that is fired during the page load.
3) Text is a property common to every validation control.
4) When .aspx page run on browser server is not used.
5) Content page has ContentPlaceHolder control.
6) Window form application contains app.config file.

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

a) Write short note on Common Language Runtime(CLR) in .NET.
b) Explain how Garbage Collection work in .NET
c) Short note on Global.asax
d) Short note on Validation Summary

Q.3 Answer the following.

a) What is .NET Framework? Explain various component of.NET Framework. **08**
b) What is Validation in asp.net? Explain any four validation control with example. **08**

Q.4 Answer the following.

a) What is .NET? Explain ASP.NET Page Life Cycle. **08**
b) What is master page? How to create master page in ASP.NET application **08**

Q.5 Answer the following.

a) What is state management? Explain client side state management techniques. **08**
b) How to create window application? Explain control hierarchy in detail. **08**

Q.6 Answer the following.

a) What is page framework? Explain different page directives in detail. **08**
b) What is namespace? Explain how to create namespace with example. **08**

Q.7 Answer the following.

a) What is the use of Session in ASP.NET? Explain with example. **08**
b) Explain the architecture of ASP.NET **08**

SLR-RI-15

Seat No.	

Set P

MCA (Semester - III) (New) (CBCS) Examination: March/April-2023
Digital Image Processing (MCA302)

Day & Date: Wednesday, 12-07-2023 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) Each pixel in an image has maximum _____diagonal neighbors.
   a) 2 b) 8
   c) 4 d) 12

2) Gamma correction is mostly used in _____.
   a) CRT devices b) Audio devices
   c) Radio devices d) Music devices

3) Which of the following is an example of order statistics filter?
   a) Median filter b) Gaussian filter
   c) Gaussian noise d) Smoothing linear filter

4) The second order derivative of image sharpening called as _____.
   a) Gaussian b) Laplacian
   c) Canny d) Euclid

5) In formula g(x, y) = T [f(x, y)], T is the _____.
   a) transformed image
   b) input image
   c) output image
   d) transformation operator / function

6) Long form of the image format GIF is _____.
   a) Geographical International Format
   b) Graphics Internode Format
   c) Graphics Input Format
   d) Graphics Interchange Format

7) A binary image is a logical array of _____.
   a) only 0's b) only 1's
   c) 0's and 1's d) any numbers between 0 – 255

8) Shot and spike noise is also known as _____.
   a) Impulse noise b) Uniform noise
   c) Exponential noise d) Gaussian noise

9) PDF in image processing is referred as _____.
   a) Portable Design Format b) Portable Density Function
   c) Probability Density Function d) Probability Density Format

10) The Hit-or-Miss transformation is defined in terms of _____structuring elements.
   a) Zero b) One
   c) Two d) None of these

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

1) A digital image is composed of a finite number of pixels.
2) Creation of new pixels is the first step in zooming digital image.
3) Convolution in spatial domain is refereed as multiplication in frequency domain.
4) Dilation followed by erosion is called opening.
5) Order statistics filters are filtering whose responses are based on ranking.
6) In Z^3 two are the coordinates and the third component are intensity.

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

a) Model of image restoration process
b) Histogram processing
c) Order statistics filter
d) Detection of discontinuities

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

a) Explain zooming and shrinking of digital images.
b) What are the steps involved in filtering in the frequency domain?

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

a) Explain neighbors of pixel.
b) Explain the probability density function Gaussian Noise.

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

a) What do you mean by image sampling and quantization?
b) Explain the Hit-or-Miss transformation

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

a) Describe any five fields that use digital image processing.
b) What are the three types of lowpass filters? Explain Ideal lowpass filter.

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

a) If the center of the mask moves any closer to the border of an image, one or more rows or columns of the mask will be located outside the image plane. What are several way to handle this situation?
b) What are the steps involved digital image processing?

SLR-RI-17

Seat No.	

Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April-2023
Mobile Computing (MCA303)

Day & Date: Sunday, 16-07-2023 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 of the following usually stores all user-related data that is also relevant to GSM mobile systems?
   a) VLR b) HMR
   c) SIM d) None of these

2) In the Cellular Network, on which of the following, the cell's shape depends?
   a) Environment conditions b) Social Conditions
   c) Political Condition d) All of the Above

3) Which of the following statements is correct about the FHSS?
   a) FHSS is a type of narrowband signal
   b) It uses the 78 frequency in the 2.4 GHz
   c) It is referred as Frequency Hopping Spread Spectrum
   d) All of the above

4) Which of the following is required to transmit the digital information using a certain frequency by translating it into an analog signal?
   a) Demodulation b) Modulation
   c) QPSK d) BSPK

5) The paging system can be used for _____.
   a) Sending numeric messages
   b) Audio Calls
   c) Sending alphanumeric messages
   d) All of the above

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

7) Which of the following problem occur due to adjacent channel interference?
   a) Cross talk b) Missed calls
   c) Blocked calls d) Near-far effect

8) A foreign agent snoops the packet flow and acknowledgement in both directions in _____.
   a) Indirect TCP b) Snooping TCP
   c) Mobile TCP d) None

9) IP assigned for a client by DHCP server is _____.
   a) for a limited period b) for an unlimited period
   b) not time dependent d) none of the mentioned

10) Which of the following is the parent class of Activity?
   a) context b) object
   c) contextThemeWrapper d) none

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

1) _____ is responsible for device drivers, power management, memory management, device management and resource access.
2) PRMA stands for _____.
3) The amount of time spent on each frequency hop is called as _____.
4) Systems take a user bit stream and perform an (XOR) with a so-called _____.
5) In Mobile Authentication the algorithm _____ is used for authentication.
6) _____ is the configuration file for the android application.

Q.2 Answer the following **16**

a) Fixed TDM
b) Types of Android Application
c) Infrared v/s Radio transmission
d) Path loss of radio signal

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

a) What is I-TCP? Explain its working in detail.
b) Write and explain the hidden and exposed terminal problems. Also write the solution for this problem.

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

a) What is MAC? Explain how the power management is done.
b) Draw and explain the working of DHCP.

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

a) Write the congestion control mechanism in traditional TCP.
b) Explain the GUI based applications for event handling.

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

a) What is handover? Write its types in details.
b) Explain android system architecture.

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

a) Explain how to manage Bluetooth connections in android devices.
b) Write the application Life Cycle for android.

SLR-RI-18

Seat No.		Set	P

MCA (Semester - III) (New) (CBCS) Examination: March/April-2023
Artificial Intelligence (MCA304)

Day & Date: Tuesday, 18-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

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

1) _____ search will not get trapped exploring a blind alley.
   a) Breadth b) Best
   c) Depth d) A*

2) In _____ the ability to represent all of the kinds of knowledge that are needed in that domain.
   a) Representational adequacy
   b) Inferential adequacy
   c) Inferential efficiency
   d) Acquisitional efficiency

3) A _____ is a structure that describes a stereotyped sequence of events in a particular context.
   a) Semantic net b) Frames
   c) Script d) Conceptual dependency

4) An augmented transition network (ATN) is a _____ procedure.
   a) Bottom-up parsing b) Top-down parsing
   c) Bidirectional parsing d) None of these

5) The traveling salesman problem involves n cities with paths connecting the cities. The time taken for traversing through all the cities, without knowing in advance the length of a minimum tour, is _____.
   a) O(n) b) O(n2)
   c) O(n!) d) O(n/2)

6) A _____ is technique that improves the efficiency of a search process, possibly by sacrificing claims of completeness.
   a) heuristic b) hill climbing
   c) search d) gradient search

7) The whole problem of representing the facts that changes as well as those that do not is known as the _____.
   a) Forward representation b) Frame axioms
   c) Frame problem d) Class inclusion

8) Problem of symbolic integration uses _____.
   a) Backward reasoning b) Forward reasoning
   c) Bidirectional reasoning d) None of these

9) In _____ feedback from the test procedure is used to help the generator decide which direction to move in the search space.
   a) Generate and test b) Hill climbing
   c) Best first search d) Simulated annealing

10) Fuzzy Logic can be implemented in _____.
   a) Hardware b) Software
   c) Both (a) and (b) d) None of the Above

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

1) In semantic nets, to find relationships among objects are determined by spreading activation out from each of two nodes and identify where the activation meets. This process is called _____.
2) _____ problem is a touring problem in which each city must be visited exactly once.
3) _____algorithm will work backward from the goal to solve a problem.
4) In _____ problems, solution steps cannot be undone.
5) _____ is a program that diagnoses infectious diseases.
6) A _____ is a collection of attributes and associated values that describe some entity in the world.

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

a) What is Artificial Intelligence?
b) What is Conceptual Dependency?
c) What is MYCIN?
d) What is PROLOG?

Q.3 Answer the following.

a) Explain different knowledge representational techniques in detail? **08**
b) Explain Unification algorithm in detail. **08**

Q.4 Answer the following.

a) Explain Breadth-First Search algorithm in detail. **08**
b) Explain Forward and Backward reasoning techniques in A.I. **08**

Q.5 Answer the following.

a) Explain Bayesian Network in detail. **08**
b) What is Frame? Explain with example? **08**

Q.6 Answer the following.

a) Explain Best-First Search algorithm in detail. **08**
b) What is Artificial Intelligence? Explain different characteristic of A.I. Problem.? **08**

Q.7 Answer the following.

a) Explain Water jug Problem in detail. **08**
b) What is Semantic Analysis? Explain? **08**

SLR-RI-19

Seat No.	

Set P

MCA (Semester - III) (New) (CBCS) Examination March/April-2023
Data Mining and Warehouse (MCA307)

Day & Date: Thursday, 20-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

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

1) AGNES stands for _____.
   a) Aglomerative Next Searching
   b) Advanced Group Nesting
   c) Aglomerative NESting
   d) Again Nesting

2) Multidimensional association rules with no repeated predicates are called _____.
   a) Interdimensional Association rules
   b) Single dimensional association rules
   c) Hybrid-dimensional Association rules
   d) None of these

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

4) Which of the following refers to the problem of finding abstracted patterns (or structures) in the unlabeled data?
   a) Reinforcement learning b) Hybrid learning
   c) Unsupervised learning d) Supervised learning

5) The Roll-up operation is also called _____.
   a) Drill-down b) Drill-up
   c) drill-rotate d) Rule-up

6) _____ is the type of relationship between fact and dimension table in a star schema.
   a) many to many b) one to one
   c) many to one d) one to many

7) Data warehouse based on _____.
   a) multidimensional data model
   b) 2D model
   c) 1D model
   d) 3D model

8) Classification is _____.
   a) The task of assigning a classification to a set of examples
   b) A subdivision of a set of examples into a number of classes
   c) Sorting the data in sequential manner
   d) Transforming it into another form

9) The same minimum support threshold is used when mining at each abstraction level is referred as: _____.
   a) Uniform support b) Same support
   c) Reduced Support d) Minimum support

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

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

1) An OLTP system usually adopts an entity-relationship (ER) data model.
2) In Snowflake schema, the data warehouse contains a large central table and a set of smaller attendant tables, one for each dimension.
3) The dice operation performs a selection on one dimension of the given cube, resulting in a subcube.
4) An Enterprise warehouse collects all of the information about subjects spanning the entire organization.
5) Data extraction, which typically gathers data from multiple, heterogeneous, and external sources.
6) 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: supervised learning.

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

a) Define Data warehouse? Explain various OLAP operations.
b) What is data cleaning? Explain various strategies for data cleaning.
c) Explain schema hierarchies with example.
d) What is association rule? Explain various applications of association rules.

Q.3 Answer the following.

a) Explain k-medoid algorithm with suitable example. **08**
b) What is classification? Explain two step process of model construction of classification. **08**

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

a) What is Association rule? Explain Market Basket Analysis as a example of it.
b) Explain the procedure of Apriori algorithm with example.

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

a) What is cluster analysis? Explain different types of data in cluster analysis.
b) Explain Agglomerative hierarchical clustering method with example.

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

a) What is Data warehouse? Explain the difference between OLTP and OLAP.
b) Describe Data warehouse architecture with well labelled diagram.

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

a) Explain the procedure for decision tree induction method with example.
b) What is Data mining? Explain various data mining primitives with example.

SLR-RI-20

Seat No.	

Set P

MCA (Semester - III) (New) (CBCS) Examination March/April-2023
Finite Automata (MCA308)

Day & Date: Thursday, 20-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

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

1) The following move of a PDA is on the basis of: _____.
   a) Present state
   b) Input Symbol
   c) Present state and Input Symbol
   d) None of the mentioned

2) A language L is said to be _____ if there is a Turing machine M such that L(M)=L and M halts at every point.
   a) Turing acceptable b) Decidable
   c) Undecidable d) None of the mentioned

3) A regular language over an alphabet $\sum$ is one that cannot be obtained from the basic languages using the operation _____.
   a) Union b) Concatenation
   c) Kleene Star d) All of the mentioned

4) The entity which generate Language is termed as: _____.
   a) Automata b) Tokens
   c) Grammar d) Data

5) The production of form non-terminal $-> \varepsilon$ is called: _____.
   a) Sigma Production b) Null Production
   c) Epsilon Production d) All of the mentioned

6) A language L is said to be Turing decidable if: _____.
   a) recursive b) TM recognizes L
   c) TM accepts L d) recursive and TM recognizes L

7) Given Language: $\{x \mid$ it is divisible by $3\}$
The total number of final states to be assumed in order to pass the number constituting {0, 1} is _____.
   a) 0 b) 1
   c) 2 d) 3

8) Complement of regular sets are _____.
   a) Regular b) CFG
   c) CSG d) RE

9) The _____ of a set of states, P, of an NFA is defined as the set of states reachable from any state in P following e-transitions.
   a) Є - closure b) Є - pack
   c) Q in the tuple d) None of the mentioned

10) The language accepted by a Turing machine is called _____.
   a) Recursive Enumerable
   b) Recursive
   c) Recursive Enumerable and Recursive
   d) None of the mentioned

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

1) A language L is accepted by a FSA if it is Recursive.
2) Recursively enumerable languages are not closed under Homomorphism.
3) Context Free Language are closed under Intersection and complement.
4) A given grammar is called ambiguous if t here is a sentence with more than one derivation tree corresponding to it.
5) If every string of a language can be determined, whether it is legal or illegal in finite time, the language is called Decidable.
6) FSM can recognize only regular grammar.

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

a) Construct FA for the following expression: -
$a(ba)^*a + a(ba)^*b\ b$

b) Define NF A with ϵ moves.

c) Show that $(a^*\ b^*) = (a+b)^*$

d) Give the applications of Context Free Grammar.

Q.3 Answer the following.

a) Find an equivalent DFA for the ϵ - NFA given in the following table: - **08**

δ	ϵ	a	b	c
$\rightarrow$ p	q, r	Φ	q	r
q	Φ	p	r	p, q
r^*	Φ	Φ	Φ	Φ

b) Prove that, if both a language L and its complement are RE, then L is recursive. **08**

Q.4 Answer the following.

a) Convert the following grammar into CNF. **08**
$S \rightarrow ABA|\epsilon$
$A \rightarrow aA|\ \epsilon$
$B \rightarrow bB|\epsilon$

b) Prove that the following language is not regular. **08**
$L = \{0^n | n$ is a prime$\}$

Q.5 Answer the following.

a) Construct a TM accepting following language. **08**
$L = \{a^m b^n c^m | m, n >= 0\}$

b) Convert the following NFA to DFA. **08**

δ	0	1
$\rightarrow$ p	q, r	q
q^*	r	q, r
r	s	P
s^*	Φ	p

Q.6 Answer the following.

a) Design a PDA for accepting the set of all strings over {a, b} with an equal number of a's and b's. The string should be accepted by both final state and empty stack. **08**

b) Define Grammar. Explain Simplification of Grammar. **08**

Q.7 Answer the following.

a) Convert the following grammar into GNF. **08**

$E \rightarrow E + T|T$

$T \rightarrow T * F|F$

$F \rightarrow (E)|a$

b) Prove that Regular Language is closed under Union and Kleene Star. **08**