SLR-GH-1

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2024
Object Oriented Programming using C++ (MCA0101)

Day & Date: Friday, 10-05-2024 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) Which of the following is the correct syntax to print the message in C++ language?
   a) cout <<"Hello world!";
   b) Cout <<Hello world!;
   c) Out <<"Hello world!;
   d) cout >>"Hello world!";

2) Which of the following is the correct identifier?
   a) $var_name b) VAR_123
   c) varname@ d) var1+var2

3) Which of the following is the correct syntax to read the single character to console in the C++ language?
   a) Read ch() b) Getline vh()
   c) get(ch) d) Scanf(ch)

4) Which one of the following represents the tab?
   a) \tab b) \t
   c) \r d) \n

5) If we stored five elements or data items in an array, what will be the index address or the index number of the array's last data item?
   a) 3 b) 5
   c) 4 d) 88

6) Which type of memory is used by an Array in C++ programming language?
   a) Contiguous b) None-contiguous
   c) Both a and b d) Not mentioned

7) Which of the following is not a kind of inheritance?
   a) Distributed b) Multiple
   c) Multi-level d) Hierarchal

8) Which of the following refers to using the existing code instead of rewriting it?
   a) Inheritance b) Encapsulation
   c) Abstraction d) None of these

9) When a=6, c = ++a; what will be the value of c?
   a) 6 b) 7
   c) 8 d) 9

10) The technique of building new classes from existing classes is called ____.
   a) Constructor b) Overloading
   c) Destructor d) Inheritance

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

1) Algorithm is the set of sequential instructions.
2) The wrapping up of data and function into a single unit (called class) is known as encapsulation.
3) By default, all the members of class in C++ are private.
4) Destructor function is executed whenever a new object is created.
5) Variables that hold memory addresses are called pointers.
6) The derived class inherits some or all of the properties of the base class.

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

a) Member functions
b) Destructor
c) Virtual function
d) Inline function

Q.3 Answer the following.

a) State the important features of object oriented programming. Compare object oriented programming with procedural oriented programming. **08**

b) What is constructor? Discuss various types of constructors with suitable example. **08**

Q.4 Answer the following

a) What is function overloading? Explain. **08**

b) Explain the concept of data hiding with suitable example. **08**

Q.5 Answer the following

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

b) What is manipulator? Discuss any four manipulators available in C++. **08**

Q.6 Answer the following

a) What is algorithm? Write the algorithm print 1-10 numbers. **08**

b) What is a flow chart? Draw a flow chart to find the greatest among any three numbers. **08**

Q.7 Answer the following

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

b) Write a C++ program to factorial of a number. **08**

SLR-GH-2

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2024
Data Structures (MCA0102)

Day & Date: Monday, 13-05-2024 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) An algorithm, which is a _____ sequence of instructions, each of which has a clear meaning and can be performed with a finite amount of effort in a finite length of time.
   a) Finite b) Infinite
   c) Less d) More

2) In an array implementation of a _____ the elements are stored in contiguous cells of an array.
   a) Number b) List
   c) Integer d) Character

3) _____ an element into the middle of the list, however, requires shifting all following elements one place over in the array to make room for the new element.
   a) Deleting b) Removing
   c) Isolation d) Inserting

4) A stack is not _____.
   a) Negative b) Enumerable
   c) Positive d) Non-Zero

5) _____ are a First-In-First-Out (FIFO) collection
   a) Graph b) Linked List
   c) Queue d) Stack

6) _____ represents parent/child relationships, but there are no rules for the structure.
   a) Array b) Tree
   c) Pointer d) Linear data

7) Internal sorting takes place in the main memory of a computer, where we can use the _____ access capability of the main memory to advantage in various ways.
   a) Sequential b) Linear
   c) Random d) Substantial

8) _____ sort is a sorting algorithm that operates by making multiple passes through the array, each time moving the largest unsorted value to the right (end) of the array.
   a) Insertion b) Selection
   c) Bubble d) Mean

9) Divide and conquer algorithms operate by breaking down large problems into _____, more easily solvable problems.
   a) Too larger b) Extended large
   c) Bigger d) Smaller

10) In a number of applications we may wish to traverse a list both _____ and backwards efficiently. This is made possible using Doubly Linked List.
   a) Previous b) Forwards
   c) Last d) Earliest

B) State True False. **06**

1) Array data structure holds a homogenous data.
2) A node in Circular Queue has previous and next node pointer fields.
3) A tree is a linear data structure, in which the elements are not stored at contiguous memory locations.
4) In a Stack, we can insert elements until queue becomes full.
5) Breadth First Search is implemented using Queue.
6) In Binary Search tree, a left is smaller than right.

Q.2 Answer the following **16**

a) What do you mean by Front and Rear?
b) What is Top of Stack?
c) What is Sparse Matrix?
d) What is Information?

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

a) What is Array? Explain in detail Single and Multidimensional array with suitable example.
b) Define Binary Tree? Explain in details characteristics and types of binary tree with suitable example?

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

a) What is Data Structures? Explain evaluating Postfix expression for the given expression:

5	1	2	+	4	*	+	3	-

b) What is Tree? Explain BFS and DFS tree traversal methods with suitable example.

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

a) What is Queue. Explain in detail DEqueue version and its type with suitable example.
b) Define Stack? Explain in detail Tower of Hanoi problem as application of Stack.

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

a) What is Linked List? Explain in detail procedure to insert element at beginning, middle and end of Doubly Linked List with suitable example.
b) What is Data? Explain in detail primitive and composite data types with example.

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

a) What is Sorting? Use Selection Sort to sort below given series-
Series- 654, 78, 91, 43, 59, 12, 1005, 63, 8, 6, 100, 946, 89, 45

b) Generate Binary Search Tree of below given series and write Pre-order, In-order and Post-order traversal of the same.
Series- 8, 11, 15, 12, 1, 6, 9, 13, 5, 10, 14, 7, 3, 0, 2, 4

SLR-GH-3

Seat No.	

Set P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2024
Advanced DBMS (MCA0103)

Day & Date: Wednesday, 15-05-2024 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 the right indicate full marks.

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

1) 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) Join d) View

2) A _____ database schema specifies how the data is stored physically on storage system or disk storage in the form of Files and Indices.
   a) physical b) conceptual
   c) logical d) None of the mentioned

3) _____ states that all operations of the transaction take place at once if not, the transaction is aborted.
   a) Consistency b) Rollback
   c) Atomicity d) Truncate

4) If there is no transitive dependency for non-prime attributes, then the relation must be in _____ normal form.
   a) Third b) Second
   c) BCNF d) First

5) If a transaction cannot complete due to some code error or an internal error condition, then _____ error occurs.
   a) Syntax b) System
   c) Logical d) Disk failure

6) _____ lock is also known as a Read-only lock. In this lock, the data item can only read by the transaction.
   a) Shared b) Exclusive
   c) Mutual d) None of these

7) _____ is represented by a double rectangle.
   a) Strong attribute b) Weak attribute
   c) Strong entity d) Weak entity

8) _____ Command can only be executed if the user has not performed the COMMIT command on the current transaction or statement.
   a) View b) Commit
   c) Rollback d) Flashback

9) _____ are designed to handle both structured and unstructured data.
   a) ORDBs b) Key
   c) RDBMs d) Entity

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

B) Write true/false **06**

1) In DBMS, constraints refer to limitations placed on data or data processes.
2) Views are a hybrid of traditional relational databases and OODBs.
3) Multiple constraints can be included in a single query.
4) Diamonds and Rhombus are used to show Relationships.
5) WHERE is used to place a constraint on aggregated properties.
6) If a table is in 3NF it is also in 4NF.

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

a) Differentiate between Schema & Instance.
b) Explain four types of Cardinality Mapping in DBMS.
c) Explain four differences between Strong & Weak Entity.
d) Elaborate on Grant & Revoke in short.

Q.3 Answer the following.

a) Explain the five components of DBMS in brief. **08**
b) Discuss two approaches to modify the database in Log-Based Recovery. **08**

Q.4 Answer the following.

a) Discuss eight advantages of DBMS in detail. **08**
b) Elaborate on 1NF & 2NF with an example each. **08**

Q.5 Answer the following.

a) Explain ACID properties in DBMS with an example. **08**
b) Discuss any four types of relational operation in detail. **08**

Q.6 Answer the following.

a) Discuss four types of Joins in detail. **08**
b) Explain CREATE, ALTER, DROP, TRUNCATE in brief. **08**

Q.7 Answer the following.

a) Explain Three schema Architecture in DBMS. **08**
b) Differentiate between Standalone & Distributed databases in brief. **08**

SLR-GH-4

Seat No.		Set	P

M.C.A. (Semester - I) (New) (CBCS) Examination: March/April-2024
Software Engineering (MCA0104)

Day & Date: Friday, 17-05-2024 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 the objects focus on the problem domain, then we are concerned with _____.
   a) Object Oriented Analysis
   b) Object Oriented Design
   c) Object Oriented Analysis and Design
   d) None of the above

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) Software Requirement Specification (SRS) is also known as specification of _____.
   a) White box testing b) Acceptance testing
   c) Integrated testing d) Black box testing

4) The software design paradigm is a part of software development and it includes _____.
   a) Design, Maintenance, Programming
   b) Coding, Testing, Integration
   c) Requirement gathering, Software design, Programming
   d) None of the above

5) The model in which the requirements are implemented by its category is _____.
   a) Evolutionary Development Model
   b) Waterfall Model
   c) Prototyping
   d) Iterative Enhancement Model

6) Alpha and Beta Testing are forms of _____.
   a) Acceptance testing b) Integration testing
   c) System testing d) Unit testing

7) Line of code (LOC) can be used to normalize quality and/or productivity measure for _____.
   a) Extended function point metrics
   b) Function point metrics
   c) Size oriented metrics
   d) None of the above

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

9) What are the characteristics of software?
   a) Software is developed or engineered; it is not manufactured in the classical sense.
   b) Software doesn't "wear out.
   c) Software can be custom built or custom build.
   d) All of the above

10) ____ 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

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

1) The software metrics chosen by an organization are driven by the business or technical goals an organization wishes to accomplish.
2) A good software development team always uses the same task set for every project to insure high quality work products.
3) Project plans should not be changed once they are adopted by a team.
4) Boundary value analysis belong to Black Box Testing.
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 questions. **16**

a) Explain why software doesn't "wear out".
b) Write a short note on software testing strategies.
c) Explain Object-oriented analysis.
d) Explain Evolving role of software.

Q.3 Answer the following.

a) Explain the software measurement and metrics for software quality. **08**
b) What is the difference between white box testing and black box testing? **08**

Q.4 Answer the following.

a) Explain various elements used in object oriented software engineering. **08**
b) What are the communication techniques used in analysis? **08**

Q.5 Answer the following.

a) Explain the linear sequential model in detail. **08**
b) Explain different myths in software engineering. **08**

Q.6 Answer the following.

a) What is software engineering? Explain different development phases in software engineering. **08**
b) What is software design? Explain various concepts of Design. **08**

Q.7 Answer the following.

a) What is data modeling? Explain entity relationships diagram with example. **08**

b) Explain prototyping model with its advantages. **08**

SLR-GH-5

Seat No.	

Set P

M.C.A. (Semester- I) (New) (CBCS) Examination: March/April-2024
Operating Systems (MCA0105)

Day & Date: Monday, 20-05-2024 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) A process can be terminated due to _____.
   a) normal exit b) fatal error
   c) killed by another process d) all of the above

2) _____ is a synchronization tool.
   a) Thread b) Pipe
   c) Semaphore d) Socket

3) CPU fetches the instruction from memory according to the value of _____.
   a) Program Counter b) Status Registrar
   c) Instruction Registrar d) Program Status Word

4) Run time mapping from virtual to physical address is done by _____.
   a) Memory management unit b) CPU
   c) PCI d) None of the above

5) Mapping of files is managed by _____.
   a) Page Table b) File System
   c) Metadata d) Virtual memory

6) Thrashing is a _____.
   a) Paging activity b) Executing activity
   c) Virtual memory activity d) Long process activity

7) _____ is used for preventing page fault.
   a) Paging b) Working Set
   c) ALR d) Ratio

8) To bring page in to memory when it is needed is called as _____.
   a) Page fault b) fragmentation
   c) Deadlock d) Demand Paging

9) In _____ file model, file is a sequence of fixed-length records, each with some internal structure.
   a) byte sequence b) record sequence
   c) tree d) None of these

10) Page stealing _____.
   a) Taking page frame from other working set.
   b) Efficient system
   c) Taking layer disk space for page in page out
   d) None of these

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

1) Round robin scheduling is a Preemptive scheduling algorithm.
2) Page number is used as an index into the page table.
3) Local & global of the following are the types of Path names.
4) The interface between user programs and the operating system is done by the system calls.
5) Throughput is the statistically average time from the moment that a batch job is submitted until the moment it is completed.
6) Processes that stay in the background to handle some activity are called daemons.

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

a) Page Table
b) Process
c) Thread
d) Directories

Q.3 Answer the following.

a) Explain different file operations in detail? **08**
b) Explain segmentation in operating system in detail. **08**

Q.4 Answer the following.

a) Explain different operating system structures in detail? **08**
b) What is a process? Explain different process states. **08**

Q.5 Answer the following.

a) Explain different components of an operating system? **08**
b) Explain first come, first serve and shortest job first scheduling algorithm. **08**

Q.6 Answer the following.

a) Explain different page replacement algorithms in detail? **08**
b) Explain program threats in detail. **08**

Q.7 Answer the following.

a) What is operating system? Explain operating system as a resource manager. **08**
b) Explain deadlock avoidance techniques in detail. **08**

SLR-GH-6

Seat No.	

Set P

M.C.A. (Semester –I) (New) (CBCS) Examination: March/April-2024
Discrete Mathematical Structures (MCA0109)

Day & Date: Wednesday, 22-05-2024 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. Nos 3 to Q. No.7.
3) Figure to right indicate full marks.

Q.1 A) Choose the correct answer. **10**

1) Which of the following statement is correct?
a) $p \vee q \equiv q \vee p$ b) $\sim(p \wedge q) \equiv \sim p \vee \sim q$
c) $p \vee (q \vee r) \equiv (p \vee q) \vee r$ d) All of the above

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

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

4) In lattice $L, a \leq b \; \forall \; a, b \in L$ iff _____.
a) $a \wedge b = a$ b) $a \vee b = b$
c) both a & b d) $a \wedge b = \phi$

5) Equivalent form of $p \vee \sim p$ is _____.
a) F b) T
c) p d) $\sim p$

6) If $A = \begin{bmatrix} 6 & 1 & 4 \\ -1 & 0 & 2 \\ 3 & 0 & -1 \end{bmatrix}$ then the trace of A is _____.
a) 0 b) 7
c) 5 d) 11

7) If $A = \{a, b\}$ and $B = \{1\}$ then $A \times B$ =_____.
a) $\{a, b, 1\}$ b) $\{(a, 1)\}$
c) $\{(a, 1), (b, 1)\}$ d) $\{(b, 1)\}$

8) A Relation R on a set POSET A satisfies _____.
a) Reflexive b) Antisymmetric
c) Transitive d) All of these

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

10) In set theory, if U is the universal set then ϕ^c = _____.
a) ϕ b) U
c) $\{\}$ d) A

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

1) If A and B are matrices of the same order then $(A+B)^T =$ _____.
2) The formula for $P\ (n,r)\ =$ _____.
3) The dual of $(p \vee q) \wedge r$ is _____.
4) A closed trail is called as _____.
5) The inverse of any invertible element is _____, in an algebraic structure.
6) The elements a and b of a poset $(S, \preccurlyeq)$ are called _____ if either $a \preccurlyeq b$ or $b \preccurlyeq a$.

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

a) Define Bipartite graph with example.

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

c) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 3 \\ 1 & 2 & 3 \end{bmatrix}$ then find $A+B, A-B$

d) Write a note on Quantifiers and Quantified statements.

Q.3 Answer the following:

a) Show that: **06**

1) $C(n,r) = C(n,n-r)$
2) $C(n,x) = C(n,y) \Rightarrow x = y$ or $x + y = n$

b) Prove that the fourth roots of unity $1, -1, i, -i$ from an Abelian multiplicative group. **10**

Q.4 Answer the following:

a) Using truth table, examine whether the following statement patterns are tautology, contradiction or contingency. **06**

1) $[p \wedge (p \rightarrow q)] \rightarrow q$
2) $(p \vee q) \wedge \sim p$

b) If $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$, find AB and BA. Show that $AB \neq BA$ **10**

Q.5 Answer the following:

a) Define each of following terms with example: **10**

1) Walk
2) Trail
3) Path
4) Cycle
5) Circuit

b) If $X = \{1,2,3,4,5,6\}$ and " / " is a partial order relation on X then draw the Hasse Diagram of $(X, /)$. **06**

Q.6 Answer the following:

a) If A, B, C are any three sets then show that: **08**

i) $A \cup (B \cup C) = (A \cup B) \cap (A \cup C)$
ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

b) Solve the system of equations: $x + y + z = 6; x - y + 2z = 5; 3x + y + z = 8$ **08**

Q.7 Answer the following:

a) Explain the types of functions. **08**

b) Prove that in any graph, the number of vertices of odd degree is always even. **08**

SLR-DH-8

Seat No.	

Set P

M.C.A. (Semester - I) (Old) (CBCS) Examination: March/April-2024
Object Oriented Programming using C++ (MCA101)

Day & Date: Friday, 10-05-2024 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) _____ is a finite set of sequential instructions.
   a) Command b) CPU
   c) Algorithm d) Variable

2) _____ is not the relational operator.
   a) ++ b) >=
   c) > d) !=

3) The _____ statements help computer to execute a group of statements repeatedly.
   a) Looping b) Assignment
   c) If-Else d) Switch

4) In _____ compiler will not automatically change one type of data into another.
   a) implicit conversion b) explicit conversion
   c) automatic conversion d) both a or c

5) The extraction operator is denoted by _____.
   a) > b) >>
   c) < d) <<

6) Which of the following are the examples of library functions in C++?
   a) clrscr() b) calculateResult()
   c) getch() d) Both a and c

7) Using a single function name to perform different type of task is known as _____.
   a) inline function b) function overloading
   c) operator overloading d) function with default argument

8) Late Binding is also refereed as _____.
   a) Compile-time polymorphism
   b) Early binding
   c) Runtime polymorphism
   d) both a and b

9) A class can be derived from another derived class which is known as _____ inheritance.
   a) Single b) Multiple
   c) Multilevel d) None of these

10) What is the output of the following program?

```
#include <iostream.h>
float cal (float value)
{
        return (3 * value);
}
void main()
{
        int a = 10;
        float b = cal ("50");
        cou<< b;
}
```

a) 150
b) 150.00
c) 30.00
d) Compilation error - Cannot convert from char to float

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

1) An identifier must begin with an alphabet or underscore.
2) Symbolic constants may be defined using *const* qualifier but not with *#define.*
3) 'C' is an example of string constant.
4) *new* operator may be used to allocate memory dynamically and that too of any type.
5) A static variable persist for the duration of a program.
6) Methods in a class can't be declared as private.

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

a) Access modifiers in C++
b) Constructor in C++
c) Scope resolution operator
d) Manipulators

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

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

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

a) What is the C++ OOPs concept?
b) Write a program to demonstrate friend function in C++.

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

a) What is call by value and call by reference in C++?
b) What are the different forms of inheritance supported by C++? Explain with examples.

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

a) Discuss how dynamic memory allocation is achieved in C++.
b) What do you mean by exception handling? Write a C++ program that throws an arithmetic exception whenever the input numbers is less than zero.

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

a) Write a C++ program to store student's data in a sequential file called *student.dat.* Use the fields Roll-number, name, and mark obtained.

b) Define operators overloading. Write a C++ program to overload '+' operator to concatenate two strings.

SLR-GH-9

Seat No.	

Set P

M.C.A. (Semester - I) (Old) (CBCS) Examination: March/April-2024
Data Structures (MCA102)

Day & Date: Monday, 13-05-2024 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 the correct alternatives from the options. **10**

1) Identify the data structure which allows deletions at both ends of the list but insertion at only one end.
   a) Priority queues b) Output restricted dequeue
   c) Stack d) Input restricted dequeue

2) The operation of processing each element in the list is known as _____.
   a) Merging b) Traversal
   c) Sorting d) Inserting

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

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

5) 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) Binary search tree d) None of above

6) Finding the location of a given item in a collection of items is called ___.
   a) Discovering b) Finding
   c) Searching d) Mining

7) The number of edges in a complete graph of n vertices is _____.
   a) $n(n-1)/2$ b) $n(n+1)/2$
   c) $n^{*}n\ /2$ d) n

8) A graph is a tree if and only if graph is _____.
   a) Contains no cycles b) Planar
   c) Completely connected d) Directed graph

9) Which data structure is used for implementing recursion?
   a) Queue b) Stack
   c) List d) Array

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

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

1) Last node in Linked List points to the NULL.
2) First In Middle Out is a principle of Queue data structure.
3) Array is a heterogeneous data structure.
4) Sparse Matrix is having more number of 1's.
5) BFS is implemented using Stack.
6) Postfix expression are being evaluated using Stack.

Q.2 Answer the following **16**

a) What do you mean by Double Ended Queue?
b) What is Abstract Data Type?
c) What is Binary Tree?
d) What do you mean by Backtracking?

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

a) What is Stack? Explain in detail various steps to infix to postfix expression:

8	+	9	-	7	/	6	*	5	+	4

b) State and explain Single and Multidimensional array with suitable example?

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

a) What is Tree? Explain Threaded and Height Balanced Trees with example?
b) State and explain basic operations on Doubly Linked Lists with suitable example?

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

a) What are the various procedure to insert and delete a data in a Circular Queue?
b) Explain in detail Stack Overflow and Underflow Condition with suitable example.

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

a) Explain in detail various Greedy Methods with example?
b) Generate Binary Search Tree of below given series and write Pre-order, In-order and Post-order traversal of the same.
Series- 19, 1, 7, 3, 10, 2, 4, 55, 8, 14, 9, 2, 11, 3, 5, 1,

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

a) Apply Radix Sort to sort below given series-
Series- 862, 58, 96, 13, 523, 73, 9, 27, 436, 5, 83, 682, 46
b) What is Dynamic Programming? Explain in detail branch and bound techniques with example?

SLR-GH-10

Seat No.	

Set P

M.C.A. (Semester - I) (Old) (CBCS) Examination: March/April - 2024
Software Engineering (MCA103)

Day & Date: Wednesday, 15-05-2024 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) Unit testing is done by _____.
   a) Developer b) User
   c) Customer d) None of the above

2) _____ of the following is/are White box technique.
   a) Statement Testing b) Decision Testing
   c) Condition Coverage d) All of the mentioned

3) SDLC stands for _____.
   a) Software Design Life Cycle
   b) System Development Life cycle
   c) Software Development Life Cycle
   d) System Design Life Cycle

4) The aim of software engineering is to produce software that is _____.
   a) Delivered on time b) Fault free
   c) Delivered within budget d) All of these

5) The entity relationship diagram _____.
   a) Depicts relationships between data objects
   b) Depicts functions that transform the data flow
   c) Indicates how data are transformed by the system
   d) Indicates system reactions to external events

6) Software failure would occur due to _____.
   a) Software delivered behind schedule
   b) Software exceeding cost estimate
   c) Difficult to maintain
   d) All of the above

7) The context diagram is also known as _____.
   a) Level-1 DFD b) Level-2 DFD
   c) Level-0 DFD d) All of the mentioned

8) CASE stands for _____.
   a) Cost Aided Software Engineering
   b) Computer Aided Software Engineering
   c) Control Aided Software Engineering
   d) None of the mentioned

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

10) _____ is an indirect measure of software development process.
a) Efficiency b) Effort Applied
c) Cost d) All of the mentioned

B) State True /False **06**

1) Software Debugging is known as finding and correcting errors in the program code.
2) One can choose Waterfall Model if the project development schedule is tight.
3) Requirements analysis is critical to the success of a development project.
4) Programming is the process of translating a task into a series of commands that a computer will use to perform that task.
5) Boundary value analysis belong to White Box Testing.
6) Project managers have to assess the risks that may affect a project.

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

a) Software Crises
b) Software Engineering
c) Interface design
d) Data Dictionary

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

a) Explain the phased development life cycle of software.
b) What is DFD? Explain with example?

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

a) What are the software metrics and measurements? Explain.
b) What is ERD? Explain with example?

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

a) Explain the software requirement analysis and specification.
b) Briefly Explain Software design process.

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

a) Compare the Black Box testing and White Box testing with an example.
b) Explain the importance of data abstraction and encapsulation in object-oriented design.

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

a) Explain about Object Oriented Analysis and Design.
b) Explain waterfall model in detail.

SLR-GH-11

Seat No.	

Set P

M.C.A. (Semester-I) (Old) (CBCS) Examination: March/April - 2024
Operating System (MCA104)

Day & Date: Friday, 17-05-2024 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) Figure to right indicate full marks.

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

1) _____ scheduling provides a latency improvement over FCFS scheduling for interactive jobs.
   a) Round robin b) Priority
   c) Shortest process next d) Guaranteed

2) Working set model for page replacement is based on the assumption of locality _____.
   a) LRU b) Working set
   c) FIFO d) NRU

3) _____ 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

4) Loading the pages before letting processes run is also called _____.
   a) Segmentation b) Swapping
   c) Pre-paging d) Paging

5) _____ is an integer variable to solve the critical section problem.
   a) Variable b) Semaphore
   c) Hardware d) Software

6) A process can be terminated due to _____.
   a) Fatal error b) Normal exit
   c) Killed by another process d) All of these

7) The software that talks to a controller, giving it commands and accepting responses, is called a _____.
   a) Device driver b) Daemons
   c) Spooling d) System calls

8) _____ algorithm is used to prevent the deadlock.
   a) FIFO b) LIFO
   c) Banker's d) Round Robin

9) A _____ memory divided into same sized blocks is called as page.
   a) Frame b) Logical
   c) Page d) Physical

10) In Unix, _____ system call is used to create a separate process.
   a) Fork b) Init
   c) Exec d) Wait

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

1) Synchronization is mainly used by process to co-ordinate their activities by exchange of information.
2) FIFO page replacement algorithm gives lowest page fault rate.
3) Copying a process from memory to disk to allow space for other processes is called Swapping.
4) Object file is a sequence of bytes organized into blocks understandable by the system's linker.
5) Process table contains the base address of each page in physical memory.
6) Processes that stay in the background to handle some activity are called daemons.

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

a) File System
b) Thread
c) Segmentation
d) Semaphore

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

a) Explain in detail the following CPU Scheduling Algorithms:
   i) FCFS
   ii) Round Robin
b) What is Virtual Memory and explain in detail with example?

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

a) Explain the different types of Operating System.
b) Explain any two page replacement Algorithm in detail?

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

a) Define the term deadlock. Explain various necessary conditions for a deadlock to occur. Explain in brief about Deadlock Prevention.
b) What is a System Call and explain?

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

a) Explain Segmentation in detail.
b) What is Thread? Explain implementation of Thread in user space?

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

a) What do you mean by Directory Structure? Also discuss different types of Directory Structure.
b) Define Operating System and explain different functions of an Operating System.

SLR-GH-12

Seat No.	

Set P

M.C.A (Semester- I) (Old) (CBCS) Examination: March/April-2024
Digital Circuits and Microprocessors (MCA105)

Day & Date: Monday, 20-05-2024 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 the right indicate full marks.

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

1) The output of an OR gate with three inputs, A, B, and C, is LOW when _____.
   a) A = 0, B = 0, C = 0 b) A = 0, B = 0, C = 1
   c) A = 0, B = 1, C = 1 d) all of the above

2) Output will be a LOW for any case when one or more inputs are zero for a(n):
   a) OR gate b) NOT gate
   c) AND gate d) NOR gate

3) The output of a gated S-R flip-flop changes only if the:
   a) flip-flop is set
   b) control input data has changed
   c) flip-flop is reset
   d) input data has no change

4) How much storage capacity does each stage in a shift register represent?
   a) One bit b) Two bits
   c) Four bits (one nibble) d) Eight bits (one byte)

5) A small circle on the output of a logic gate is used to represent the:
   a) Comparator operation b) OR operation
   c) NOT operation d) AND operation

6) A NAND gate has:
   a) active-LOW inputs and an active-HIGH output
   b) active-LOW inputs and an active-LOW output
   c) active-HIGH inputs and an active-HIGH output
   d) active-HIGH inputs and an active-LOW output

7) A NOR gate with one HIGH input and one LOW input:
   a) will output a HIGH b) functions as an AND
   c) will not function d) will output a LOW

8) Which of the following buses is primarily used to carry signals that direct other ICs to find out what type of operation is being performed?
   a) Data bus b) Control bus
   c) Address bus d) Address decoder bus

9) A _____ digit is called a bit. Information is represented in digital computers by groups of bits.
   a) Digital b) Binary
   c) Analog d) Byte

10) Which of the following are the three basic sections of a microprocessor unit?
   a) Operand, register, and arithmetic/logic unit (ALU)
   b) Control and timing, register, and arithmetic/logic unit (ALU)
   c) Control and timing, register, and memory
   d) Arithmetic/logic unit (ALU), memory, and input/output

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

1) The 8086 is 8 bit parallel CPU.
2) Four data select lines are required for selecting eight inputs.
3) All computer programs for a machine are called Software.
4) Strobe signal used to control the number of clocks when serially loading a shift register.
5) I/O mapped systems identify their input/output devices by giving them a(n) 16-bit port number.
6) If an active-HIGH S-R latch has a 0 on the S input and a 1 on the R input and then the R input goes to 0, the latch will be RESET.

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

a) What is half adder?
b) What is D Flip Flop?
c) Define basic and derived gates?
d) What is Registers?

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

a) State and explain in detail 8086 Microprocessor pin configuration?
b) What is ICs? Explain various types of ICs in detail.

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

a) State and explain in detail working of edge triggered Flip-Flops.
b) What is Subtractor? Explain various types of Subtractor in detail?

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

a) State and explain in detail comparison of derived gates?
b) Explain various types of Shift Registers in detail.

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

a) State and explain in detail various types of Decoders with suitable example?
b) What is K-Map? Explain the k-map simplification method for the following Boolean function.

$$F(M.N.O,P) = \sum(0,2,5,7,8,10,13,15)$$

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

a) What is Boolean Algebra? Prove and Explain DeMorgans' Law with suitable example?
b) What is Multiplexer? Explain different types of Multiplexer with suitable example.

SLR-GH-13

Seat No.	

Set P

M.C.A. (Semester - I) (Old) (CBCS) Examination: March/April-2024
Discrete Mathematical Structures (MCA109)

Day & Date: Wednesday, 22-05-2024 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) Which of the following proposition is true?
   a) $p \wedge q \equiv p \vee q$ b) $p \wedge q \equiv F$
   c) $(p \vee q) \vee r \equiv p \vee (q \wedge r)$ d) $p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$

2) A statement pattern whose truth value is true for all possible combinations of truth values of its prime components is called a _____.
   a) Tautology b) Contradiction
   c) Contingency d) Biconditional

3) If A and B are any 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) $A \cap B = \{x: x \in A \text{ or } x \in B\}$

4) If a finite set S has n elements, then the power set of S has _____ elements.
   a) 2^n b) $2n$
   c) n^2 d) $2 + n$

5) A graph G that contains a cycle which includes all the vertices of G is called _____.
   a) planar graph b) Hamiltonian graph
   c) pseudo graph d) Eulerian graph

6) 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) $\sum_{k=0}^{\infty} k.x^k$

7) Which of the following algebraic structure is not commutative?
   a) $(R, +)$ b) $(R, .)$
   c) $(Z, +)$ d) $(Z, -)$

8) Everybody in a room shake hands with everybody else. The total number of handshakes is 66. The total number of persons in the room is _____.
   a) 11 b) 12
   c) 13 d) 14

9) 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) $\lambda^3 - \lambda^2 + 36\lambda - 32 = 0$

10) In any graph G, the number of vertices of odd degree is always ____.

a) prime b) even

c) odd d) composite

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

1) If A and B be any two matrices which are conformable for product AB then $(AB)^T = A^T B^T$.
2) An empty graph is a graph with 2 edges.
3) If the task A can be performed in exactly 55 ways and a task B can be performed in exactly 10 ways, then the number of ways of performing task A or task B is 65.
4) The determinant of the matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is ad-bc.
5) If A and B are subsets of a universal set U then, $(A \cap B)^{\sim} = A^{\sim} \cup B^{\sim}$.
6) A set of parallel lines is forms an equivalence relation.

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

a) Prove that the fourth roots of unity $\{1, -1, i, -i\}$ form an abelian multiplicative group.

b) Evaluate the following:

i) 15_{P_6}

ii) 12_{C_9}

c) If matrix $A = \begin{bmatrix} 0 & 2 \\ -3 & 4 \end{bmatrix}$ then find A^{-1}.

d) Define Isolated vertex and Pedant vertex with give examples.

Q.3 Answer the following.

a) Define the following terms with examples: **10**

i) Graph
ii) Simple Graph
iii) Multigraph
iv) Walk
v) Path

b) Draw the Hasse diagram of the poset $(P(S), \subseteq)$ where $P(S)$ is the power set on $S = \{1,2,3\}$ **06**

Q.4 Answer the following.

a) Express the following matrix as a sum of a symmetric and skew symmetric matrix. **08**

$$\begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix}$$

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

i) Identity function
ii) Onto function
iii) One-One function
iv) Constant function

Q.5 Answer the following.

a) Find the adjoint of the matrix $\begin{bmatrix} 6 & 3 & 2 \\ 2 & 0 & -2 \\ 5 & 4 & 1 \end{bmatrix}$. **08**

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

$2x + y + 2z = 0$
$2x - y + z = 10$
$x + 3y - z = 5$

Q.6 Answer the following.

a) Write the negations of the following. **08**

i) $\sim(p \wedge q) \vee (p \vee \sim q)$
ii) $(p \vee \sim q) \wedge r$
iii) $(\sim p \vee \sim q) \vee (p \wedge \sim q)$
iv) $(p \wedge \sim q) \rightarrow (p \wedge \sim q)$

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

1) $(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$
2) $\sim p \wedge [(p \vee \sim q) \wedge q]$

Q.7 Answer the following.

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

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

b) Prove that, $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$; $0 \leq r \leq n$. **06**

SLR-GH-15

Seat No.	

Set P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April-2024
Java Programming (MCA01201)

Day & Date: Thursday, 09-05-2024 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) Which of the following feature is not supported by java?
   a) Multiple inheritance b) Pointers
   c) Destructor d) All of these

2) The execution of an applet begins from _____ method.
   a) init () b) stop ()
   c) start () d) paint ()

3) Which of these keywords are used to implement synchronization?
   a) synchronize b) syn
   c) synch d) synchronized

4) Which of the following tool is used to compile java code?
   a) java b) javadoc
   c) javac d) javadb

5) Which of these packages contains all the classes and methods required for even handling in Java?
   a) java.applet b) java.awt
   c) java.event d) java.awt.event

6) Which of these methods are used to register a keyboard event listener?
   a) KeyListener() b) addKistener()
   c) addKeyListener() d) eventKeyboardListener()

7) Which of these is a mechanism for naming and visibility control of a class and its content?
   a) Object b) Packages
   c) Interfaces d) None of the Mentioned

8) Which of the following can be operands of arithmetic operators?
   a) Numeric b) Boolean
   c) Characters d) Both Numeric & Characters

9) What is it called when the child object also gets killed when the parent object is killed in the program?
   a) Encapsulation b) Association
   c) Aggregation d) Composition

10) Which method can we use in an applet to output a string?
   a) transient() b) drawString()
   c) print() d) display()

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

1) JDK stands for Java deployment kit.
2) The break statement in Java is used to skips the current iteration
3) Array in java is collection of elements of different types.
4) Objects in java are reference variables.
5) 'this' keyword in java is used to hold the reference of the current object.
6) Wrapper class in java is used to encapsulate primitive data types.

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

a) Define two looping statements.
b) Explain types of Array.
c) Explain Thread Priority.
d) Write a short note on Class and Objects

Q.3 Answer the following **16**

a) Explain Life Cycle of Applet.
b) What are the conditional statements in java? Explain with example.

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

a) Define Inheritance. Explain types of inheritance with example.
b) List and explain interface that support for AWT event handling

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

a) What is multithreading? Explain the concept of thread priority.
b) Explain the features of Java.

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

a) Explain the term:
   i) BufferedReader
   ii) InputStream
   iii) OutputStream
b) Write a program to create a thread by extending Thread class.

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

a) What is Exception Handling? Explain types of Java Exceptions.
b) Explain different access specifiers in java.

SLR-GH-16

Seat No.	

Set P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April-2024
Python Programming (MCA01202)

Day & Date: Saturday, 11-05-2024 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 the output of this expression, 5 * 1 * * 5?
   a) 25 b) 75
   c) 5 d) 1

2) ____ is used to show single line comment in python?
   a) % b) #
   c) && d) // //

3) The Output of '123'+4 in python is _____.
   a) 1234 b) 127
   c) 123 d) Error

4) The dictionary is declared in _____bracket.
   a) ( ) b) [ ]
   c) (( )) d) { }

5) What will be the output of below Python code?
```
str1="Application"
str2=str1.replace('a', 'A')
print(str2)
```
   a) application b) Application
   c) ApplicAtion d) None of these

6) What is the output of $len([3, 3, 3,3])$?
   a) 1 b) 2
   c) 3 d) 4

7) Following set of commands are executed in shell, what will be the output?
```
>>>str = 'hello'
>>>str [1:3]
```
   a) hel b) lo
   c) Olleh d) el

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

9) A constructor function of a class is denoted or specified by _____.
   a) _ _cons_ _ ( ) b) init_( )
   c) _ _init_ _ ( ) d) _class_( )

10) Which widget are used to get the data from the user?
   a) Button b) Label
   c) Entry d) Frame

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

1) Bar chart is a graph that represents the category of data with rectangular bars with lengths and heights that is proportional to the values which they represent.
2) By default a series in Pandas has integer indices numbered sequentially from 0 (zero).
3) run( ) in the Thread class is the entry point for a thread.
4) When a program raises an exception, it must handle the exception otherwise the program will be immediately terminated.
5) The readline( ) method is used to read a single line from the file.
6) Python's dictionary stores data in key-value pairs. The key-value pairs are enclosed with curly braces { } and each key-value pair is separated by # sign.

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

a) Indexing and slicing
b) Nested list
c) if-else statement
d) Methods in Thread class

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

a) What is a string? Describe any four string functions/methods with example.
b) What are the different loop control statements available in Python? Explain with suitable examples.

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

a) What is a list? Explain various list operations with example.
b) Write in brief about Dictionary in Python. Write operations with suitable examples.

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

a) What is exception handling? What are different built-in exceptions in Python?
b) List out some common functions and methods provided by the ***"re"*** module.

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

a) Write a Python program that creates a GUI with a textbox, Ok button and Quit button. On clicking Ok, the text entered in textbox is to be printed in Python shell; on clicking Quit, the program should terminate.
b) Explain various methods available in OS module.

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

a) What is NumPy? What are different array attributes with example? With example show how to transpose rows and columns of a 2 x 3 matrix.
b) Give example to create a dataframe from a dictionary. With example explain loc and iloc attributes for selecting rows in dataframe.

SLR-GH-17

Seat No.	

Set P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April-2024
Computer Communication Network (MCA01203)

Day & Date: Tuesday, 14-05-2024 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 (MCQ). **10**

1) A topology that consists of multiple devices connected by connectors or the main cable is called _____.
   a) Ring b) Mesh
   c) Bus d) Star

2) _____layer of OSI model is responsible for the delivery of individual packets from the source host to the destination host.
   a) Physical b) Network
   c) Application d) Data Link

3) _____protocol is used to find the hardware address of a local device.
   a) ARP b) RARP
   c) IP d) ICMP

4) _____ is the use of Bridge in Network.
   a) to connect LANs.
   b) to separate LANs.
   c) to control Network Speed.
   d) All of the above.

5) _____is the address size of IPv6.
   a) 32 bit b) 64 bit
   c) 128 bit d) 256 bit

6) _____protocol is used to securely access web content.
   a) FTP b) HTTP
   c) DHCP d) ARP

7) ____ is the standard port number for HTTP.
   a) 21 b) 25
   c) 80 d) 110

8) ____ of the following is NOT a type of network attack.
   a) Phishing b) Spoofing
   c) Hacking d) Encryption

9) TCP groups a number of bytes together into a packet called _____.
   a) Packet b) Buffer
   c) Segment d) Stack

10) _____ of the following routing saves more memory in case of storing information about routers in the network.
   a) Link state routing b) Hierarchical routing
   c) Broadcast routing d) Distance vector routing

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

1) In OSI model, Session layer provides dialog control and token management.
2) The variation in the packet arrival times is called jitter.
3) In Segmentation, to many packets present in the network causes packet delay and loss that degrades performance.
4) In a peer-to-peer network, any client computer can also be a server.
5) Nodes in a network (router) has only one MAC address in the network.
6) Internet works on circuit switching.

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

a) RARP.
b) Computer Network.
c) Packet Switching.
d) NAT.

Q.3 Answer the Following. **16**

a) Explain the following:
   1) LAN
   2) WAN
b) What is routing? Explain shortest path routing algorithm?

Q.4 Answer the Following. **16**

a) Differentiate between virtual circuit and datagram subnet?
b) What is TCP/IP model? Explain functions of each layer?

Q.5 Answer the Following. **16**

a) Draw and explain each field in the IP header structure?
b) Explain ICMP protocol.

Q.6 Answer the Following. **16**

a) What is UDP? Explain in detail?
b) Explain error detecting code by data link layer.

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

a) Explain token bucket algorithm.
b) What is WWW and explain?

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Seat No.		Set	P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April-2024
System Software (MCA01204)

Day & Date: Thursday, 16-05-2024 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) _____ software consists of variety of programs that supports the operation of a computer.
   a) Container b) Computer
   c) Operating d) System

2) A machine language program was loaded into memory and prepared for execution by a _____.
   a) Controller b) Loader
   c) Translator d) Code block

3) CISC stands for _____.
   a) Complex Instruction Set Computers
   b) Computer Interpreter Set Compilers
   c) Connection Internet Set Controllers
   d) Core Intel Set Chipsets

4) Assembler directives _____ used to reserve the indicated number of bytes for a data area.
   a) RESW b) RESD
   c) RESB d) RESQ

5) A _____ produces a linked version of the program which is written to a file or library for later execution.
   a) Script Editor b) Code Editor
   c) Line Editor d) Linkage Editor

6) Most _____ compilers and assemblers produces object modules, not executable machine language programs.
   a) LINUX b) MS-DOS
   c) UNIX d) WINDOWS

7) A _____ instruction is simply a notational convenience for the programmer.
   a) Micro b) Macro
   c) Module d) Modem

8) _____ bridges the semantic gap between a programming language domain and an execution domain and generates a target program.
   a) Assembler b) Linker
   c) Compiler d) Command

9) A _____ binding is performed before the execution of a program begins.
   a) Static b) Dynamic
   c) Pre-execution d) Post-execution

10) Each program in the _____ software is called a system program.
a) System b) Application
c) Hardware d) Program

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

1) A language designed for gluing together existing program components is called a Scripting Language.
2) To use Graphical User Interface based systems, User needs a substantial training to learn use of commands.
3) A Shadow instructions allow the programmer to write a shorthand version of the program.
4) RISC system is characterized by a standard, fixed instruction length and single-cycle execution of most instructions.
5) One characteristic in which most system software differs from applications software is machine dependency.
6) Resource programs performs various tasks such as editing a program, compiling it and arranging for its execution.

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

a) What is SunOS Linker?
b) What do you mean by MASM?
c) Define YACC Compiler?
d) What is Macro?

Q.3 Answer the following.

a) Define ISC. State and Explain in detail CISC and RISC Machines? **08**
b) What is Loader? Explain in detail various features of machine dependent loader? **08**

Q.4 Answer the following.

a) What is Compiler? Explain in detail the basic functions of the Compiler? **08**
b) State and explain in detail essential difference between a linkage editor and linking loader on the basis of processing of an object program? **08**

Q.5 Answer the following.

a) State and explain in detail various functions required to accomplish translation of source program to object code in a simple SIC Assembler? **08**
b) What is Load on Call? Explain in detail process of loading and calling of a subroutine using Dynamic Linking? **08**

Q.6 Answer the following.

a) Define Assembler. State and differentiate between One pass and Multi pass Assemblers? **08**
b) What is Bootstrap Loader? Explain in detail design of Absolute Loader and related functions? **08**

Q.7 Answer the following.

a) State and explain Macro processing features of ANSI C programming language with suitable example? **08**
b) What is System Software? Explain in detail SIC standard model Machine Architecture with most commonly encountered hardware features? **08**

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Seat No.	

Set P

M.C.A. (Semester - II) (New) (CBCS) Examination: March/April-2024
UML (MCA01207)

Day & Date: Saturday, 18-05-2024 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) Which of the following OOAD artifacts is the most useful if you want to plan project activities such as developing new functionalities or test cases?
   a) Deployment diagrams b) Use cases
   c) Swimlanes d) Package diagrams

2) _____diagram helps to show Dynamic aspects related to a system.
   a) Component b) Interaction
   c) Deployment d) Use case

3) The deployment diagram shows:
   a) Distribution of components on the nodes in a system.
   b) Objects of a system.
   c) Distribution of classes.
   d) Functions of a system

4) In UML the general-purpose mechanism used for organizing elements into groups is _____.
   a) a use case diagram b) an interaction diagram
   c) a package d) a composite diagram

5) _____ are the levels of visibility in UML that can be applied to attributes and operations.
   a) Public b) Private
   c) Protected d) All of these

6) UML stands for _____.
   a) Unique Modified Language
   b) Unique Markup Language
   c) Unified Modeling Language
   d) Union Model Language

7) Which one is used to display a set of objects and their relationships?
   a) Object diagram b) Class diagram
   c) Use case diagram d) Activity diagram

8) What happens when a superclass is changed?
   a) All subclasses inherit the change.
   b) The operations of the subclass must be changed
   c) Additional operations in the subclass that are not associated with the superclass must change.
   d) Only the operations of the superclass are inherited

9) _____ are the notations used for the use case diagrams.
   a) Use case b) Actor
   c) Prototype d) Use case and Actor

10) _____ specifies the behavior of a system and is a description of a set of sequence of actions.
   a) Object diagram b) Nodes
   c) Class diagram d) Use case

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

1) A stereotype is used for extending the UML language.
2) In UML half arrow is used to represent asynchronous messages.
3) Dividing a complex system into small, self-contained pieces that can be managed independently is called as modularity.
4) A statechart diagram describes attributes of object.
5) Sequence diagram is time oriented.
6) Class Diagram is used to display a set of objects and their relationships.

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

a) Interface
b) State Machines
c) Dependency relationship
d) Polymorphism

Q.3 Answer the following.

a) Explain UML software development life cycle. **08**
b) What is a diagram in UML? What are the different kinds of diagram in UML? **08**

Q.4 Answer the following.

a) What are the differences between component and node? What are the types of components in UML? **08**
b) What are the principles of modeling? Explain importance of modeling. **08**

Q.5 Answer the following.

a) What are the various relationships used in UML? **08**
b) What are the basic concepts of a sequence diagram? Explain with an example. **08**

Q.6 Answer the following.

a) What is use case? Explain different elements in use case with an example. **08**
b) Draw a neat use case diagram for online railway reservation system. **08**

Q.7 Answer the following.

a) What are activity diagrams? Explain the symbols used in activity diagram with example. **08**
b) What are the uses of deployment diagram? Explain the basic elements of a deployment diagram with neat diagram. **08**

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Seat No.	

Set P

M.C.A. (Semester - II) (New/Old) (CBCS) Examination: March/April-2024
Java Programming (MCA201)

Day & Date: Thursday, 09-05-2024 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 the output of following line of code?

```
System.out.println(" \" Hello \" ");
```

a) Hello b) \ Hello \
c) “Hello” d) \ “Hello \”

2) _____ is a container that stores related classes and interfaces.
a) Panel b) Applet
c) Frame d) Package

3) _____ exception occurs of we attend to access an element in the array whose index is out bounds.
a) NumberFormatException
b) ArithmeticException
c) ArrayIndexOutOfBoundsException
d) None of these

4) _____ is an abstract computer which runs the compiled java Programs.
a) javac b) javadoc
c) javap d) JVM

5) An _____ is a named collection of method definitions, without implementations.
a) package b) class
c) object d) interface

6) The _____ is executed irrespective if there is an error or not.
a) ArithmeticException b) catch block
c) finally block d) none of these

7) _____ is caused when a program tries to store the wrong type of data in an array.
a) ArrayIndexOutOfBoundsException
b) IOException
c) ArrayStoreException
d) NullPointerException

8) Java performs release of memory occupied by unused objects (with no reference to the object) automatically, it is called _____.
a) finalization b) memory collection
c) garbage collection d) none of these

9) _____ statement is used to terminate the execution of iteration statement.
   a) continue b) switch
   c) break d) if-else

10) _____ group related classes and interfaces together and thus avoiding any name conflicts.
   a) Panel b) Frame
   c) Packages d) Applet

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

1) We can throw Java's built-in exception manually using the keyword *throw.*
2) A static method cannot refer to keywords *this* or *super.*
3) One interface can be extended by another interface.
4) Every object has its own copy of all class variables of the class.
5) If no exception occurs in the 'try' block, then all 'catch' blocks are executed.
6) Thread is also referred to as light weight process.

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

a) Class FileWriter
b) Garbage Collector
c) Abstract Class
d) Access modifiers

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

a) What is the use of operator *new?* What is the use of a constructor? State various features of constructor.
b) Write a program to compute the sum of the first N terms in the following series. $-1 + 2 - 3 + 4 - 5 + \ldots$.

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

a) Write a program that will display first N prime numbers.
b) How to define abstract methods? What is difference between ordinary and abstract method.

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

a) Explain how to create a new thread using the class Thread with suitable example.
b) Describe GridLayout with example.

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

a) Explain the life cycle of a thread.
b) Describe how radio button is put on applet? Describe how an event generated by a radiobutton is handled.

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

a) Explain with example exception handling in Java.
b) Explain the following:
   i) Class
   ii) Object
   iii) Method
   iv) Polymorphism

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Seat No.	

Set P

M.C.A. (Semester - II) (New/Old) (CBCS) Examination: March/April-2024
Advanced DBMS (MCA202)

Day & Date: Saturday, 11-05-2024 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) What does an RDBMS consist of?
   a) Collection of Records b) Collection of Keys
   c) Collection of Tables d) Collection of Fields

2) Which command is used to remove a relation from an SQL?
   a) Drop table b) Delete
   c) Purge d) Remove

3) _____ operations do not preserve non-matched tuples.
   a) Left outer join b) Inner join
   c) Natural join d) Right outer join

4) In general, a file is basically a collection of all related _____.
   a) Rows & Columns b) Fields
   c) Database d) Records

5) Which of the following is not an example of DBMS?
   a) MySQL b) Microsoft Acess
   c) IBM DB2 d) Google

6) Which of the following command is a type of Data Definition language command?
   a) Create b) Update
   c) Delete d) Merge

7) In which one of the following, the multiple lower entities are grouped (or combined) together to form a single higher-level entity?
   a) Specialization b) Generalization
   c) Aggregation d) None of the above

8) The term “TCL” stands for _____.
   a) Ternary Control Language
   b) Transmission Control Language
   c) Transaction Central Language
   d) Transaction Control Language

9) A transaction completes its execution is said to be _____.
   a) Committed b) Aborted
   c) Rolled back d) Failed

10) Which of the following is NOT an Oracle-supported trigger?
   a) BEFORE b) DURING
   c) AFTER d) INSTEAD OF

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

1) DBMS is software for creating and managing databases.
2) Atomicity ensures that all operations within the work unit are completed successfully.
3) The relational database model was created by E.F. Codd in 1989.
4) Triggers can operate on insertion, deletion, and updates.
5) An attribute declared as Primary Key can have NULL as its value.
6) CRATE TABLE is one of the data definition language commands in SQL.

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

a) Explain Nested Table and Varying Array.
b) Explain Two phase commit protocol.
c) List and explain Users of DBMS.
d) Explain TCL commands.

Q.3 Answer the following.

a) Explain Steps for query processing. **08**
b) What is database recovery? Explain log based recovery and check point. **08**

Q.4 Answer the following.

a) Explain components of DBMS. **08**
b) What is file system? Explain Limitations of traditional file. **08**

Q.5 Answer the following.

a) Explain various data models used for database design. **08**
b) Explain the following SQL constructs with examples: **08**
1) Order by
2) Group by and having

Q.6 Answer the following.

a) Explain DDL, DML and DCL. **08**
b) What is serialization? Explain two phase locking protocol. **08**

Q.7 Answer the following.

a) What is normalization? Explain 1NF & 2NF. **08**
b) What is Join? Explain outer join. **08**

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Seat No.	

Set P

M.C.A. (Semester - II) (New/Old) (CBCS) Examination: March/April-2024
Computer Communication Network (MCA203)

Day & Date: Tuesday, 14-05-2024 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 (MCQ) **10**

1) DHCP stands for _____.
   a) Dynamic Host Configuration Protocol
   b) Dynamic Host Configuration Particle
   c) Design Host Configuration Protocol
   d) None of the above

2) _____ is used to discover who the neighbors are?
   a) Link state update b) Hello
   c) Link state ack. d) Database description

3) _____ one of the following is a dynamic routing algorithm.
   a) Flooding b) Shortest path routing
   c) Link state routing d) None of the above

4) The IP and IPV6 are the common protocols and technologies in _____ layer.
   a) Transport b) Network
   c) Session d) Physical

5) Identify the first network which was based on TCP/IP protocol.
   a) ARPANET b) Ethernet card
   c) HUB d) Router

6) What is the Location of a resource on the internet given by _____.
   a) e-mail b) IP
   c) Protocol d) URL

7) Identify among the following the network device used to connect two dis-similar types of networks.
   a) Switch b) Hub
   c) Bridge d) Gateway

8) Parity bits are used _____.
   a) To encrypt data b) To identify user
   c) To detect error d) None

9) Identify the switching method in which the message is divided into small packets.
   a) Virtual switching b) Packet switching
   c) Message switching d) None

10) A collection of computers and devices connected together via communication devices and transmission media is called a _____.
   a) Workgroup b) Network
   c) Mainframe d) Server

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

1) Physical layer is concerned with transmitting raw bits over a communication channel.
2) ARP is the protocol used by Internet protocol to map IP network addresses to hardware addresses.
3) In Client/Server network, each computer can act as a client or server.
4) The most popular method for connecting nodes on a network is circuit switching.
5) POP3's design makes it best suited to users who retrieve their mail from the same workstation all the time.
6) A network location of a Web page is a URL.

Q.2 Answer the following **16**

a) Computer Network
b) WWW (World Wide Web)
c) Dynamic web documents.
d) Jitter

Q.3 Answer the following **16**

a) Explain LAN, MAN and WAN in detail?
b) Explain virtual-circuit and Datagram subnet in detail?

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

a) Explain TCP/IP reference model?
b) Explain how network can be differ (Network Differences) with each other?

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

a) What is IP? Explain IP header structure in detail?
b) Explain NAT (Network Address Translation) in detail?

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

a) Explain Berkeley socket in detail?
b) Explain SMTP (Simple Mail Transfer Protocol) in detail?

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

a) Explain Transport service primitives in detail?
b) Explain WAP (Wireless Application Protocol) in detail?

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Seat No.	

Set P

M.C.A. (Semester - II) (New/Old) (CBCS) Examination: March/April-2024
System Software (MCA204)

Day & Date: Thursday, 16-05-2024 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) Which of the following is not an example of system software?
   a) Language Translator b) Utility Software
   c) Communication Software d) Word Processors

2) A person who designs the programs in a software package is called:
   a) User b) Software Manager
   c) System Developer d) System Programmer

3) Assembler is used as a translator for?
   a) Low level language b) High Level Language
   c) COBOL d) C

4) What do you call a program in execution?
   a) Command b) Process
   c) Task d) Instruction

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

6) A Compiler has _____ phase?
   a) 7 b) 6
   c) 8 d) None of these

7) Which of the following system software always resides in the main memory?
   a) Text Editor b) Assembler
   c) Linker d) Loader

8) A Lex compiler generates _____.
   a) Lex object code b) Transition code
   c) C Tokens d) None of these

9) Pentium Pro processor is uses _____.
   a) RISC approach b) CISC approach
   c) SIC approach d) None of these

10) The assembler stores all the names and their corresponding values in ___.
   a) Special purpose Register b) Symbol Table
   c) Value map Set d) None of the mentioned

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

1) Macro processors are machine dependant.
2) SIC machines do not support floating point data format.
3) When the computer is first turned on or restarted bootstrap loader is executed.
4) UltraSPARC are CISC machines
5) Software Package is a group of programs that solve multiple problems.
6) System Software is designed to control the operations of a computer.

Q.2 Write short note. **16**

a) SPARC assembler
b) SunOS Linkers.
c) MSAM macro processor
d) Program linking

Q.3 Answer the following

a) Explain machine-independent features of Loader **08**
b) Explain location counter in assembler. **08**

Q.4 Answer the following

a) Explain various phases of compilation process. **08**
b) How object program can be processed using linkage editor? Explain with diagram. **08**

Q.5 Answer the following

a) Explain in brief basic macro processor functions. **08**
b) Explain machine dependent compiler features. **08**

Q.6 Answer the following

a) What are the algorithm and data structures used for macro processor? Explain in detail. **08**
b) What is Loader? Explain Loader design options. **08**

Q.7 Answer the following

a) Explain PowerPC architecture for RISC machine. **08**
b) What is system software? Differentiate system software with application software. **08**

SLR-GH-25

Seat No.	

Set P

M.C.A. (Semester - II) (New/Old) (CBCS) Examination: March/April-2024
UML (MCA207)

Day & Date: Saturday, 18-05-2024 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) Which one is not a relationship in a UML?
   a) Dependency b) Assertion
   c) Association d) Realization

2) Which one is not belong to structural diagrams?
   a) Class diagram b) Data diagram
   c) Object diagram d) Component diagram

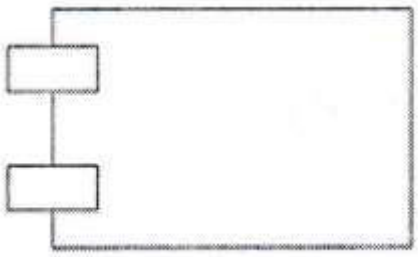
3) An object is selected for modeling a system provided _____.
   a) Its attributes are invariant during operation of the system
   b) Its attributes change during operation of the system
   c) It has numerous attributes
   d) It has no attributes relevant to the system

4) Which of the following UML diagrams has a static view?
   a) Collaboration b) Use case
   c) State chart d) Activity

5) UML stands for?
   a) Unified Marketing Language
   b) Unified Modeling Language
   c) Union Modeling Language
   d) Under Modeling Language

6) An attribute is a data item held by which of the following?
   a) Class b) Object
   c) Both A and B d) None of these

7) Which core element of UML is being shown in the figure?



   a) Node b) Interface
   c) Class d) Component

8) _____ is graphically rendered as a dashed line.
   a) Generalization b) Association
   c) Dependency d) Realization

9) What does a deployment diagram consists of?
   a) Computational resource
   b) Communication path between resource
   c) Artifacts that execute resource
   d) All of the above

10) Which among these are the common notations for deployment diagrams?
   a) Artifacts and nodes
   b) Stereotypes
   c) Components
   d) All of the above

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

1) Attributes are the data that represents characteristics of interest about an object.
2) Behavior is the packaging of several items together into one unit.
3) An object class is a set of object instances that share the same attributes and behavior.
4) Activity diagrams depict the sequential flow of a use case or business process.
5) Composition is drawn with a filled diamond.
6) New actors may be added to a use-case diagram during object-oriented analysis.

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

a) Describe Behavioral diagrams in UML.
b) Write a short note on Stereotypes in UML.
c) What is the importance of using UML?
d) Describe State machines.

Q.3 Answer the following.

a) What is package? Describe generalization among packages. **08**
b) Explain different structural things. **08**

Q.4 Answer the following.

a) Explain class diagram with an example. **08**
b) What is UML? Explain conceptual model of UML. **08**

Q.5 Answer the following.

a) Explain the difference between interaction diagram and collaboration diagram. **08**
b) Draw the use case diagram for online digital library system. **08**

Q.6 Answer the following.

a) What are the advantages of UML? Explain building blocks of UML. **08**
b) Draw and explain the activity diagram for online airline reservation system. **08**

Q.7 Answer the following.

a) Explain in detail software development life cycle. **08**
b) What is an interface? Discuss the ways that element realizes an interface with example. **08**

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Seat No.	

Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April-2024
.NET Technology (MCA301)

Day & Date: Friday, 10-05-2024 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) Figure to right indicate full marks.

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

1) Which of the following is a valid data type in ASP.NET?
   a) int b) long
   c) double d) all of these

2) Which of the following is NOT a valid event in an ASP.NET web page lifecycle?
   a) Init b) Prelnit
   c) PostInit d) End

3) What is the purpose of the Validation controls in ASP.NET?
   a) To validate user input
   b) To handle user authentication and authorization
   c) To store application settings and configuration information
   d) To store user data

4) What is the purpose of the web.config file in an ASP.NET application?
   a) To store application settings and configuration information
   b) To store user data
   c) To store web page content
   d) To store server logs

5) The main function of _____ is to convert the managed code into native code and then execute the code.
   a) FCL b) CLR
   c) CLS d) CTS

6) _____ describes how types are declared, used, and managed in the runtime.
   a) FCL b) CLR
   c) CLS d) CTS

7) A delegate defines _____.
   a) a class that encapsulates methods
   b) a means of passing arrays into methods
   c) a substitute for an inherited method
   d) None of these

8) Which commands are used to specify settings of an .aspx file?
   a) class b) directives
   c) events d) validation

9) Which of the following webserver control used as container for other server controls in a ASP.NET webpage?
   a) placeholder b) panel
   c) table d) imagemap

10) _____ 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

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

1) SOAP stands for Simple object access protocol.
2) CTS ensures complete interoperability among applications, regardless of the language used to create the application.
3) CTS describes how types are declared, used, and managed in the runtime.
4) IsPostBack property ‘s return type is Boolean.
5) Classes declared with the sealed keyword can be base class
6) Placeholder webserver control is used as container for other server controls in a ASP.NET webpage.

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

a) What are the basic events available with Global.asax
b) Explain in brief namespace
c) Explain IF and IF Else statement with example.
d) Explain in brief features of C#.

Q.3 Answer the following.

a) Explain windows form and its class hierarchy. **08**
b) Explain ASP.net page life cycle. **08**

Q.4 Answer the following.

a) Explain ASP.Net architecture. **08**
b) Explain ASP.Net directives in brief. **08**

Q.5 Answer the following.

a) Explain in brief about ASP.Net webparts and their advantages. **08**
b) Explain in brief Visual studio IDE Components. **08**

Q.6 Answer the following.

a) Explain Masterpage in detail. **08**
b) Explain Client side and server side validations. **08**

Q.7 Answer the following.

a) Explain in brief session management in ASP.Net. **08**
b) Explain for loop and nested for loop with example. **08**

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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April-2024
Digital Image Processing (MCA302)

Day & Date: Monday, 13-05-2024 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 meant by Region of Interest (ROI) operations?
   a) Dilation b) Masking
   c) Erosion d) Hit-or-Miss

2) _____ is the set of common elements in set X and set Y.
   a) Union b) Segmentation
   c) Intersection d) Acquisition

3) Median filters belong to which category of filter?
   a) Frequency Domain Filter b) Harmonic filter
   c) Linear Spatial Filter d) Order Statistics Filter

4) Which of the following the general representation of power transformation?
   a) $c = s - r + \gamma$ b) $s = r + c + \gamma$
   c) $s = cr^{\gamma}$ d) $s = r^{c}$

5) A second order derivative operator can be defined as _____.
   a) Laplacian b) Gaussian
   c) Histogram d) None of the above

6) What is the name of the process that moves a filter mask over the image, followed by calculating the sum of products?
   a) Correlation b) Convolution
   c) Segmentation d) Morphology

7) What is the sum of all components of a normalized histogram?
   a) 1 b) -1
   c) 0 d) None of the above

8) Which of the following is the first fundamental step in image processing?
   a) Filtration b) Image restoration
   c) Image enhancement d) Image acquisition

9) Image enhancement approaches in _____ category are based on direct manipulation of pixels in an image.
   a) Spatial domain b) Frequency domain
   c) both a and b d) none of these

10) _____ attempts to reconstruct an image that has been degraded by using prior knowledge of the degradation phenomenon.
   a) Image Display b) Image Restoration
   c) Image Compression d) Image Zooming

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

1) A smoothing filter can also be called a median filter.
2) Image compression divides the image into its constituent parts.
3) The restoration techniques are oriented toward modeling the degradation and applying the inverse process in order to recover the original image.
4) A digital image is composed of a finite numbers of pixels.
5) Convolution in spatial domain is refereed as multiplication in frequency domain.
6) Structuring elements are not required to define Hit-or-Miss transformation.

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

a) Dilation operation
b) Boundary extraction
c) Histogram processing
d) Image restoration process

Q.3 Answer the following.

a) Explain the fundamental Steps in Digital Image Processing with a neat block diagram. **08**
b) What are the three basic types of gray-level transformations? Describe. **08**

Q.4 Answer the following.

a) Explain the concept of Sampling and Quantization. **08**
b) Explain how the first order derivatives are used for Image Sharpening. **08**

Q.5 Answer the following.

a) What is histogram processing and histogram equalization? **08**
b) Explain the following gray level transformations with a neat graph. **08**
i) Log transformations
ii) Power law transformations

Q.6 Answer the following.

a) Explain the steps involved in image filtering in frequency domain. **08**
b) Discuss in detail: Region based segmentation. **08**

Q.7 Answer the following.

a) What is thresholding? Write algorithm to calculate global threshold. **08**
b) Explain the Hit-or-Miss transformation. **08**

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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April-2024
Mobile Computing (MCA303)

Day & Date: Wednesday, 15-05-2024 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 is not the basis for SDMA algorithm?
   a) Space Division multiplexing
   b) Cells
   c) Sectorized antennas
   d) Space Division Duplex

2) In IEEE 802.11 wireless LAN, _____ sub layer handles modulation and encoding/decoding of signal.
   a) COA b) PMD
   c) MAC d) AMD

3) In mobile IP, a tunnel usually ends at _____.
   a) Foreign Agent b) Internet
   c) Home agent d) Router

4) _____ is used for cellular phone, satellite, and wireless LAN communications.
   a) Infrared waves b) Microwaves
   c) Radio Waves d) None of these

5) BSS in GSM stands for _____.
   a) Basic Service Sub-system
   b) Basic Services Set
   c) Base Station Sub-system
   d) Base Station Service

6) What level does TCP uses flow and error control mechanisms?
   a) Physical level b) Data link level
   c) Network level d) Transport level

7) Congestion control involves two factors that measure the performance of a network _____.
   a) Delay b) Throughput
   c) Both a & b d) None of these

8) GSM stands for _____.
   a) Global Structure for Mobile
   b) Global System for Module communications
   c) Global Segment for Mobile
   d) Global system for mobile communications

9) _____ is used to provide the data or to access the data by other applications which are stored by itself.
   a) Activity b) Broadcast Receiver
   c) Content-provider d) Service

10) Which is not an Android layout?
   a) Activity b) Relative
   c) Frame d) Table

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

1) The main purpose of _____ is to inform the home agent of the current location for correct forwarding of packets.
2) Forming groups of piconets called _____.
3) The file used to create String Resource in android is _____.
4) Piconet can have 1 Master & _____ Slaves Connected.
5) _____ is the range where signal cannot be detected.
6) Infrastructure bases WLAN network uses _____ for communication between nodes.

Q.2 Answer the following **16**

a) Ranges in Signal Propagation
b) AppManifst in Android
c) Scatternet
d) Near & Far Terminals Problem.

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

a) Explain architecture of Bluetooth in detail.
b) What is multiplexing? Explain SDM & TDM in detail.

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

a) Explain android application priority and process states.
b) Write a note on Classical TCP & Indirect TCP.

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

a) Explain DSSS in detail.
b) What is modulation? Explain the PSK modulation.

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

a) Explain CSMA/CD in detail.
b) Explain the Architecture of GSM in detail.

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

a) Write a note on Android GUI Architecture.
b) What is signal propagation? Explain the path loss ratio in detail.

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Set P

MCA (Semester - III) (New) (CBCS) Examination: March/April-2024
Artificial Intelligence (MCA304)

Day & Date: Friday, 17-05-2024 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.
3) Figure to right indicate full marks.

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

1) Knowledge in AI can be represented as _____.
   a) Propositional logic b) predicate logic
   c) Frame d) Both (a) and (b)

2) _____ is not the required property of Knowledge representation.
   a) Inferential Efficiency
   b) Inferential Adequacy
   c) Representational Verification
   d) Representational Adequacy

3) _____algorithm related to the Artificial Intelligence.
   a) Routing algorithm b) Greedy algorithm
   c) Hill climbing algorithm d) Recursive algorithm

4) An agent can improve its performance by _____.
   a) Learning b) responding
   c) observing d) None of these

5) _____ of the following is not an application of AI.
   a) Intelligent Robots b) Handwriting Recognition
   c) Speech Recognition d) Content mining

6) In a _____, information is represented as a set of nodes connected to each other by a set of labeled arcs, which represent relationship among the nodes.
   a) Frames b) Scripts
   c) Semantic net d) Conceptual dependency

7) _____search will not get trapped exploring a blind alley.
   a) Breadth b) Best
   c) Depth d) A*

8) 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

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) 8-puzzle is a _____problem.
   a) Ignorable b) Irrecoverable
   c) Recoverable d) None of the Above

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

1) LISP is the first AI programming language.
2) Depth search implements stack operation for searching the states.
3) General algorithm applied on game tree for making decision of win/lose is DFS/BFS Search Algorithms.
4) Forward chaining algorithm will work backward from the goal to solve a problem.
5) A knowledge-based agent can combine general knowledge with current percepts to infer hidden aspects of the current state prior to selecting actions.
6) Graph used to represent semantic network is Undirected graph.

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

a) MYCIN
b) Mundane task
c) Conceptual dependency
d) Bayesian Network

Q.3 Answer the following.

a) Explain water jug problem in detail? **08**
b) Explain Best first search algorithm in detail. **08**

Q.4 Answer the following.

a) Explain different approaches to knowledge representation in detail? **08**
b) Explain Semantic network in detail. **08**

Q.5 Answer the following.

a) Explain forward versus backward reasoning technique in detail? **08**
b) Explain Baye's theorem in detail. **08**

Q.6 Answer the following.

a) Explain Fuzzy logic in detail. **08**
b) What is expert system? Explain in detail. **08**

Q.7 Answer the following.

a) Explain syntactic processing and semantic analysis in natural language processing? **08**
b) What is artificial intelligence? Explain different applications of artificial intelligence. **08**

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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April-2024
Data Mining and Warehouse (MCA307)

Day & Date: Monday, 20-05-2024 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 A) Choose the correct alternative: **10**

1) The data Warehouse is _____.
   a) Read only b) Write only
   c) read write only d) None of these

2) _____ describes the data contained in the data warehouse.
   a) Relational data b) Metadata
   c) Operational data d) Informational data.

3) The star schema is composed of _____ fact table.
   a) four b) two
   c) three d) one

4) Which typically gathers data from multiple, heterogeneous, and external sources?
   a) Refresh Data b) Data Transformation
   c) Data Cleaning d) Data Extraction

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

6) _____ is the process of partitioning a set of data objects (or observations) into subsets.
   a) classification b) Clustering
   c) prediction d) None of these

7) A divisive hierarchical clustering method employs a _____ strategy.
   a) Top-down b) Bottom-up
   c) Random d) None of these

8) The problem of finding hidden structure in unlabeled data is called
   a) Supervised learning b) Reinforcement learning
   c) Unsupervised learning d) None of these

9) The Roll-up operation is also called
   a) Drill-up b) Drill-down
   c) Drill-rotate d) Rule-up

10) A multilayer feed-forward neural network consist of an input layer, one or more hidden layers, and an _____ layer.
   a) Input b) Output
   c) Different d) None of these

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

1) A data warehouse is a repository of information collected from multiple sources.
2) Regression analysis is a statistical methodology that is most often used for numeric prediction.
3) Loose coupling means that a DM system will not utilize any function of a DB or DW system
4) A data cube allows data to be modelled and viewed in single dimension.
5) The roll-up operation performs aggregation on a data cube, either by climbing up a concept hierarchy for a dimension or by dimension reduction.
6) An enterprise warehouse collects all of the information about subjects spanning the entire organization.

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

a) What is Data Integration? Explain with suitable example.
b) What is data mining? Explain 'Task Relevant Data' as a primitive.
c) Explain Supervised learning with example.
d) Explain Agglomerative hierarchical clustering method with example.

Q.3 Answer the following questions.

a) What is Data warehouse? Explain difference between OLTP and OLAP. **08**
b) What is Association rule? Explain Market Basket Analysis as a example of it. **08**

Q.4 Answer the following.

a) Describe Data warehouse architecture with well labelled diagram. **08**
b) Explain major four types of concept hierarchies. **08**

Q.5 Answer the following question.

a) Explain k-means algorithm with suitable example. **08**
b) Explain Back Propagation method with suitable example. **08**

Q.6 Answer the following.

a) What is classification? Explain different issues regarding with classifications. **08**
b) Explain how association rules are constructed in multi-level hierarchy. **08**

Q.7 Answer the following.

a) What is Data Science? Explain the difference between Data Analytics and Data Science. **08**
b) Explain different Applications of Data Mining. **08**

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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination: March/April-2024
Finite Automata (MCA308)

Day & Date: Monday, 20-05-2024 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) Figure to right indicate full marks.

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

1) The purpose of _____ is to remember relevant portion of the systems history.
   a) Memory b) CPU
   c) State d) Process

2) _____ are useful models when designing software that processes data with a recursive structure.
   a) Automata b) Grammars
   c) Complexity d) Theory

3) _____ programs goes only so far, since we cannot try our program on every input.
   a) Recursion b) Output
   c) Testing d) Resulting

4) The set of character strings, and the sets are called _____.
   a) Natural Numbers b) Character Array
   c) String Array d) Languages

5) An _____ is a finite, nonempty set of symbols.
   a) String b) Alphabet
   c) Variable d) Common language

6) A _____ is a finite sequence of symbols chosen from some alphabet.
   a) Sentence b) String
   c) Grammar d) Free set

7) _____ languages can be viewed as a sets of strings.
   a) Uncommon b) Better
   c) Natural d) Common

8) _____ are automata that model the power of real computers.
   a) Machine b) Turing Machines
   c) Mechanical Machines d) Hydraulic Machines

9) _____ grammars are an important notation for describing the structure of programming languages.
   a) Content Free b) Contain Free
   c) Context Free d) Control Free

10) Finite automaton has a set of states, and its _____ moves from state to state in response to external inputs.
   a) Control b) Un control
   c) Systematic d) Infinite

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

1) Nondeterministic allows to program solutions to problems using higher level language.
2) A transition function that takes as arguments a state and an input symbol and return a state.
3) Deterministic finite automaton DFA in proofs is represented using five tuple notation.
4) The regular expression 01*+10* does not denotes the language consist of all strings.
5) The intersection of two languages is the set of strings that are in either of the two set.
6) Upper case letters near end of alphabet are strings of terminals.

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

a) What do you mean by Context-Free Grammars?
b) What is Closure in Automata?
c) Define Turing Machine?
d) State the meaning of Pushdown Automata?

Q.3 Answer the following.

a) What do you mean by Regular Expression? Explain in detail regular expressions and finite automata? **08**
b) Define Pumping Lemma. How to prove that a language is not context free using the Pumping Lemma? **08**

Q.4 Answer the following.

a) State and Explain in detail Finite Automata with Epsilon Transition? **08**
b) Explain in detail various ambiguity in grammars and languages? **08**

Q.5 Answer the following.

a) State and Explain the concept and uses of Parse Tree in Compiler Design? **08**
b) What are the different Programming techniques for Turing machines? **08**

Q.6 Answer the following.

a) Discuss in detail Equivalence of Pushdown Automata with Context-Free Grammar with suitable example? **08**
b) State and Explain in detail DFA (Deterministic finite automata) to design FA with $\sum = \{0,1\}$ accepts even number of 0's and even number of 1's? **08**

Q.7 Answer the following.

a) What is Restricted Turing Machine? Discuss in detail various types of Restricted Turing Machine? **08**
b) State and Explain in detail NFA (Nondeterministic finite automata) to design an NFA with $\sum = \{0,1\}$ in which double '1' is followed by double '0'? **08**