Seat No.	

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Objects Oriented Programming using C++ (2318101)

Day & Date: Friday, 10-05-2024   Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
           2) Figure to right indicate full marks.

Q.1   **A)**   **Choose correct alternative for the following.**   **08**

     1)   Who invented C++?
        a)   Dennis Ritchie   b)   Ken Thompson
        c)   Brian Kernighan   d)   Bjarne Stroustrup

     2)   What is C++?
        a)   C++ is an object oriented programming language
        b)   C++ is a procedural programming language
        c)   C++ supports both procedural and object oriented programming language
        d)   C++ is a functional programming language

     3)   Which of the following is the correct syntax of including a user defined header files in C++?
        a)   #include [userdefined]   b)   #include "userdefined"
        c)   #include <userdefined.h>   d)   #include <userdefined>

     4)   Which of the following is used for comments in C++?
        a)   /* comment */   b)   // comment */
        c)   // comment   d)   both // comment or /* comment */

     5)   Which of the following user-defined header file extension used in C++?
        a)   hg   b)   cpp
        c)   h   d)   hf

     6)   Which of the following is a correct identifier in C++?
        a)   VAR_1234   b) $var_name
        c)   7VARNAME   d)   7var_name

     7)   Which of the following is not a type of Constructor in C++?
        a)   Default constructor   b)   Parameterized constructor
        c)   Copy constructor   d)   Friend constructor

     8)   Which of the following approach is used by C++?
        a)   Left-right   b)   Right-left
        c)   Bottom-up   d)   Top-down

B) Write True/False. 04
1) Sub classes may also be called Child classes/Derived classes.
   a) True   b) False
2) It is not possible to achieve inheritance of structures in C++?
   a) True   b) False
3) Super classes are also called Parent classes/Base classes.
   a) True   b) False
4) There are only two possible values for the bool data type.
   a) True   b) False

Q.2 Answer the following. (Any Six) 12
a) Define Data Abstraction.
b) What is the return type of main ()?
c) What is the use of this keyword in C++?
d) How string is used in C++? How can we create string object?
e) Explain the process of open, read, write and close files?
f) Write down the example to overload unary and binary operators in C++.
g) What are the different features of C++?
h) What do you mean by a friend class?

Q.3 Answer the following. (Any Three) 12
a) Differentiate between break and continue statement.
b) Compare and Contrast late binding and early binding.
c) Write a C++ program demonstrating use of the friend function for operator overloading.
d) Write a program to demonstrate friend function in C++.

Q.4 Answer the following. (Any Two) 12
a) What are the different ways to define member functions of a class. What is the role of scope resolution operator in the definition of member function?
b) When do we need multiple catch blocks for a single try block? Give an example.
c) Write down different file opening modes in C++.

Q.5 Answer the following. (Any Two) 12
a) Discuss different string handling functions available in C++.
b) What is a user defined exception? Write down the scenario where we require user defined exceptions.
c) What are the different forms of inheritance supported by C++? Explain with examples.

Seat No.		**Set**	**P**

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Advanced DBMS (2318102)

Day & Date: Monday, 13-05-2024   Max. Marks: 60
Time: 03:00 PM To 05.30 PM
Instructions: 1) All questions are compulsory.
              2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative.   **08**

1) In which of the following formats data is stored in the database management system?
   a) Image   b) Text
   c) Table   d) Graph

2) The ability to query data, as well as insert, delete, and alter tuples, is offered by _____.
   a) TCL (Transaction Control Language)
   b) DCL (Data Control Language)
   c) DDL (Data Definition Language)
   d) DML (Data Manipulation Language)

3) Which forms have a relation that contains information about a single entity?
   a) 4NF   b) 2NF
   c) 5NF   d) 3NF

4) Which one of the following refers to the "data about data"?
   a) Directory   b) Sub Data
   c) Warehouse   d) Meta Data

5) In order to undo the work of transaction after last commit which one should be used?
   a) View   b) Commit
   c) Rollback   d) Flashback

6) Primary key can be?
   a) NULL   b) NOT NULL
   c) Both NULL and NOT NULL   d) None of these

7) The overall description of a database is called _____.
   a) Data definition   b) Data manipulation
   c) Data integrity   d) Database schema

8) Who interact with the system without writing a program?
   a) Naïve users   b) Casual users
   c) Sophisticated user   d) All of These

B) **Write True/False** 04

1) The relational database model was created by E.F. Codd.
   a) True   b) False

2) A primary goal of a database system is to share data with multiple users.
   a) True   b) False

3) The primary key does not necessarily have to be unique for a given table.
   a) True   b) False

4) DROP TRIGGER Command is not used to drop the trigger.
   a) True   b) False

Q.2 **Answer the following. (Any Six)** 12
   a) Define instance and schema?
   b) Define single valued and multivalued attributes.
   c) What is first normal form?
   d) Define Lock?
   e) What is meant by log-based recovery?
   f) List the properties of transaction.
   g) Define Super key.
   h) Define Shadow Paging?

Q.3 **Answer the following. (Any Three)** 12
   a) Define DBMS? Explain Advantages and limitations of DBMS.
   b) Define Join and explain Outer join with example?
   c) Define Attribute and explain the types of Attributes?
   d) Explain Two phase locking Protocol?

Q.4 **Answer the following. (Any Two)** 12
   a) Write a short note on Generalization, Specialization and Aggregation.
   b) Write a short note on transaction Properties.
   c) Define Normalization? Explain Types 1NF,2NF,3NF,4NF.

Q.5 **Answer the following. (Any Two)** 12
   a) Explain Aggregate Function with example?
   b) Define Clauses? Explain types of clauses with examples?
   c) Explain Database Users?

Seat No.

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Data Structures and Algorithms (2318107)

Day & Date: Wednesday 15-05-2024   Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
               2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives   **08**

1) Each data structure is built up from the _____ data types of the underlying programming language using the available data structuring facilities.
   a) Derived   b) Java
   c) Basic   d) C++

2) A list is easily traversed and new elements can be _____ readily to the tail of the list.
   a) Appended   b) Deleted
   c) Scrolled   d) Downloaded

3) Array contains total _____ elements with respect to its index value.
   a) (n-2)   b) (n)
   c) (n-1)   d) (1-n)

4) _____ adds an item to the top of the stack.
   a) Posh   b) Push
   c) Pop   d) Post

5) An queue is like a line at a store checkout counter, people enter the line and are serviced in the order they _____.
   a) Leave   b) Exit
   c) Arrive   d) Sort

6) In Binary Tree each node can have 0, 1, or _____ children.
   a) -1   b) N
   c) 2   d) More

7) The bottleneck is usually the movement of data between _____ and Secondary storage, and we must move data in large blocks to be efficient.
   a) Internal   b) External
   c) Main   d) Hard Disk

8) Insertion sort works by making a _____ pass through the array and inserting the current value into the already sorted (beginning) portion of the array.
   a) Multiple   b) Greater
   c) Single   d) Double

B) Write True or False. 04
1) In Bubble sort, a pivot index element partition the array into two arrays.
2) Float (float) is the most common numeric data type used to store numbers without a fractional component.
3) Double ended queue is where insertion of item is done at either of the end.
4) Arithmetic expression can be evaluated using Tree.

Q.2 Answer the following. (Any Six) 12
a) What is Linked List?
b) What is Linear Data Structure?
c) What is Priority Queue?
d) Define Matrix-Array?
e) How to implement Breadth First Search?
f) What do you mean by External Sorting?
g) What do you mean by LIFO?
h) What is Homogenous Data?

Q.3 Answer the following. (Any Three) 12
a) What do you mean by Tree and Binary tree?
b) Explain operations and various applications of Stack?
c) Explain in brief Circular Doubly Linked List with example?
d) State and explain in brief Queue Overflow and Underflow conditions.

Q.4 Answer the following. (Any Two) 12
a) Illustrate solution for Tower of Hanoi Problem with four disks and three pegs?
b) Explain in detail Two Dimensional Array to do matrix multiplication with suitable example.
c) Perform Radix Sort on given series below:
Series- 1056, 9785, 6975, 8811, 4652, 1237, 8654, 9469, 1643, 9173, 2876

Q.5 Answer the following. (Any Two) 12
a) Perform Quick Sort and result the sorted list of the below given series-
Series- 164, 3647, 987, 465, 7894,1234, 852,147, 9631, 8426, 9137, 4628
b) Generate Binary Search Tree of given series and state the pre-order, in-order and post-order traversing results of it.
Series- 45, 15, 79, 10, 20, 55, 90, 12, 50
c) Discuss in detail various operations on Singly Linked List to insert or delete an item from it?

Seat No.

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Operating System (2318108)

Day & Date: Wednesday, 15-05-2024   Max. Marks: 60
Time: 03:00 PM To 05:30 PM
Instructions: 1) All questions are compulsory.
                2) Figures to the right indicate full marks.

Q.1 A) Choose the correct alternatives from the options.   **08**

1) The Operating system manages _____.
   a) Memory   b) Processor
   c) Disks and I/O devices   d) All of the above

2) Moving process from main memory to disk is called _____.
   a) Caching   b) Swapping
   c) Termination   d) Interruption

3) Which of the following is a service not supported by the operating system?
   a) Protection   b) Accounting
   c) Compilation   d) I/O operation

4) Which of the following do not belong to queues for processes?
   a) Job Queue   b) PCB queue
   c) Device Queue   d) Ready Queue

5) In a multiprogramming environment _____.
   a) the processor executes more than one process at a time
   b) the programs are developed by more than one person
   c) more than one process resides in the memory
   d) a single user can execute many programs at the same time

6) Identify the OS which is not based on Linux.
   a) Ubuntu   b) BSD
   c) CentOS   d) Red Hat

7) The information about all files is kept in _____.
   a) Operating system   b) Separate directory structure
   c) Swap space   d) None of the mentioned

8) In real time operating system _____.
   a) Process scheduling can be done only once
   b) All processes have the same priority
   c) Kernel is not required
   d) A task must be serviced by its deadline period

B) Write True/False. 04
1) Logical memory is broken into blocks of the same size called frames.
2) Kernel is the first part of operating system to load into memory during booting.
3) Operating system is not the interface between user and computer.
4) The Banker's algorithm is used to prevent deadlock in operating systems.

Q.2 Answer the following. (Any Six) 12
a) List out the features of Linux operating system.
b) What are the components of operating system?
c) Write the full form of FCFS and SJF.
d) What are the operations on process?
e) Define Distributed operating system.
f) What is segmentation?
g) Write a note on types of shell in Linux.
h) Define thread.

Q.3 Answer the following. (Any Three) 12
a) What is the use of job queues, ready queues and device queues?
b) Explain Deadlock detection technique.
c) Explain the various types of system call provided by operating system.
d) Explain inter-process communication in detail.

Q.4 Answer the following. (Any Two) 12
a) Explain all File Allocation Methods.
b) Define the term Operating System. Explain different types of Operating System.
c) What is process? Explain the process state transition diagram

Q.5 Answer the following. (Any Two) 12
a) What is multiprogramming? Explain distributed and time sharing operating System.
b) Define CPU scheduling. Explain priority and round robin scheduling.
c) What are the methods of free space management of disk? Explain.

Seat No.

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Research Methodology in Computer Science (2318103)

Day & Date: Friday, 17-05-2024   Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
                 2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative.   08

1) The word research derived from the French word:
   a) Reserch   b) Recerch
   c) Resourch   d) Riserch

2) What is the purpose of research?
   a) To identify problem   b) To find the Solution
   c) Both A and B   d) None of these

3) Fundamental research is the type of research that:
   a) Gathers knowledge skill
   b) Discovers ways of finding solution of an immediate problem
   c) is useful for formulating hypothesis or testing hypothesis
   d) None of these

4) Basic research is also known as _____ research.
   a) Fundamental   b) Applied
   c) descriptive   d) Analytical

5) _____ constitutes the blueprint for the collection, measurement and analysis of data
   a) Research Problem   b) Literature review
   c) Research design   d) Analysis

6) _____ research, the researcher has to use facts or information already available and analyze these to make a critical evaluation of the material.
   a) Quantitative   b) Analytical
   c) Descriptive   d) Qualitative

7) Published information in a particular subject area is discussed in?
   a) Journals   b) Research proposal
   c) Literature review   d) Bioethics

8) The purposes of Literature review are all, except?
   a) Copy pasting   b) Discovering
   c) Synthesizing   d) Identifying

B) **Write True or False** 04
1) Descriptive Research includes surveys and fact-finding enquires of different kinds.
2) The best way of understanding the problem is to discuss it with one's colleagues or with those having some expertise in the matter.
3) Qualitative research is based on the measurements of quantity or amount.
4) The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.

Q.2 **Answer the following. (Any Six)** 12
a) What is Research?
b) What do you mean by periodicals?
c) What is patent?
d) What is Literature Review?
e) What is e-research?
f) What is purpose of section and subsections?
g) What is mean by Research Report?
h) State the three sections of research format.

Q.3 **Answer the following. (Any Three)** 12
a) Write a short note on IEEE Format
b) State and explain major contents of research proposal.
c) Explain Motivations in Research.
d) Explain Ethical issues in research

Q.4 **Answer the following. (Any Two)** 12
a) Explain the difference between quantitative and qualitative research.
b) Explain the major objectives of Research.
c) Explain different steps involved in Research process.

Q.5 **Answer the following. (Any Two)** 12
a) What is Research Design? Explain the features of Research Design.
b) What are the general rules of research report writing? Explain it.
c) Explain different types of charts used in research report.

Seat No.

M.Sc. (Semester - I) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Object Oriented Programming Using C ++ (MSC18101)

Day & Date: Friday, 10-05-2024　　　　　　　　　　　　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 for the following.　　　　　　10

1) _____ means the ability to take more than one form.
　　a) Inheritance　　　　　　　b) Polymorphism
　　c) Abstraction　　　　　　　d) None of these

2) A _____ is a collection of objects of similar type.
　　a) Object　　　　　　　　　b) Polymorphism
　　c) Class　　　　　　　　　　d) Inheritance

3) Destructor has a same name as the constructor and it is preceded by?
　　a) !　　　　　　　　　　　　b) ?
　　c) $　　　　　　　　　　　　d) ~

4) Which of the following can be considered as the members that can be inherited but not accessible in any class?
　　a) Public　　　　　　　　　b) Protected
　　c) Private　　　　　　　　　d) Both a and c

5) A _____ is a 'special' member function whose task is to initialize the objects of its class.
　　a) constructor　　　　　　　b) pointer
　　c) constant　　　　　　　　d) inline

6) A _____ statement defines a block of statements to handle the exception appropriately.
　　a) catch　　　　　　　　　　b) try
　　c) throw　　　　　　　　　　d) re-throw

7) The _____ errors occur due to poor understanding of the problem and solution procedure.
　　a) syntactic　　　　　　　　b) logical
　　c) major　　　　　　　　　　d) syntax

8) How to access the object in the class?
　　a) Ternary operator
　　b) Direct member access operator
　　c) Scope resolution operator
　　d) None of the above

9) More than one user-defined function can have the same name and perform different operations, is known as _____.
　　a) inheritance　　　　　　　b) operator loading
　　c) function overloading　　　d) both c and b

10) ____ are operators that are used to format the data display.
    a) manipulators   b) denominator
    c) Relational   d) Bitwise

B) Write True/False.   **06**
1) A static function can have access to only other static member declared in the same class.
2) A non-member function can have an access to the private data of a class.
3) Inheritance is a collection of objects of similar type.
4) 'integer' is used to declare integer data type.
5) Constructors are invoked automatically when the objects are created.
6) Keywords refer to the names of variables, functions, arrays, classes, etc.

Q.2 Answer the following.   **16**
a) What is function prototyping? Explain with example.
b) What is class? Explain with example.
c) Write a short note on enumerated data types.
d) What is friend function?

Q.3 Answer the following.   **16**
a) What is static member function? Explain in detail.
b) Explain the difference between call by reference and return by reference.

Q.4 Answer the following.   **16**
a) Explain Dynamic Allocation Operators in detail.
b) What is constructor? Explain parameterized constructor with example.

Q.5 Answer the following.   **16**
a) What is polymorphism? Explain Operator overloading with example.
b) Write a C++ program to demonstrate the use of function overloading.

Q.6 Answer the following.   **16**
a) What is inheritance? Explain different types of inheritances.
b) Write a C++ Program to implement multilevel inheritance. (Assume your own data).

Q.7 Answer the following.   **16**
a) What are manipulators? Explain the procedure for creating your own manipulators.
b) Explain the use of following statements with syntax and example.
   i) setf( )
   ii) width( )
   iii) precision( )
   iv) fill( )

Seat No.

Set P

M.Sc. (Semester - I) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Advanced DBMS (MSC18102)

Day & Date: Monday, 13-05-2024   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) Figures to the right indicate full marks.

Q.1 A)   Choose correct alternative.   10

1)   The purpose of the ACID properties in database transactions is _____.
　　 a)   To simplify database queries
　　 b)   To improve database performance
　　 c)   To increase data redundancy
　　 d)   To ensure data consistency and integrity

2)   The ____ normal form ensures that there are no repeating groups of data and all non-key attributes are fully functional dependent on the primary key.
　　 a)   First Normal Form (1NF)   b)   Second Normal Form (2NF)
　　 c)   Third Normal Form (3NF)   d)   Fourth Normal Form (4NF)

3)   The _____ join returns only the rows that have matching values in both tables.
　　 a)   Inner   b)   Outer
　　 c)   Left   d)   Right

4)   The purpose of a DBMS transaction log is _____.
　　 a)   To store the schema definition of the database
　　 b)   To optimize query performance
　　 c)   To record changes made to the database for recovery purposes
　　 d)   To manage user access control

5)   Which of the following is not a type of database constraint?
　　 a)   Default constraint   b)   Foreign key constraint
　　 c)   Check constraint   d)   Index constraint

6)   The main drawback of the relational database model is _____.
　　 a)   Difficulty in representing complex relationships
　　 b)   Lack of data independence
　　 c)   Poor performance in handling large volumes of data
　　 d)   Limited support for transactions

7) The ___ is not valid datatype in oracle sql.
   a) CLOB   b) NCHAR
   c) FLOAT   d) DATETIME

8) Which of the following is true about triggers in Oracle PL/SQL?
   a) Triggers cannot be defined on views.
   b) Triggers are executed explicitly using the EXECUTE command.
   c) Triggers are automatically invoked when a specified event occurs.
   d) Triggers can only be defined for INSERT operations

9) The _____ SQL function is used to concatenate two or more strings.
   a) CONCAT   b) CONCATENATE
   c) CONCAT_STR   d) STR_CONCAT

10) The purpose of the SQL HAVING clause is _____.
   a) To filter rows based on a specified condition
   b) To group rows that have the same values
   c) To select rows from a table
   d) To filter grouped rows based on a specified condition

B) Write true/false.   **06**
1) The _____ SQL command is used to change the structure of a table.
2) The _____ statements can call predefined exceptions, or user-defined exceptions.
3) The view of total database content is known as _____.
4) An entity set that does not have sufficient attributes to form a primary key is known as _____.
5) The _____ operation is used if we are interested in only certain columns of a table.
6) If R has m tuples and S has n tuples, then the maximum size of join of R and S is _____.

Q.2 Answer the following.   **16**
   a) Explain %Type and %Rowtype with example.
   b) Explain Join Dependency with example.
   c) What are Transaction States? Explain in details.
   d) Explain strong and weak entities in details.

Q.3 Answer the following.
   a) What is difference between 3NF and BCNF? Explain in details with example.   **08**
   b) What is cursor? Explain different type of cursors. Write a cursor to iterate through employee records and apply the updating of salary.   **08**

Q.4   Answer the following.
    a)   What is relational algebra? Explain in detail.   **08**
    b)   What are different keys and constraints? Explain each with example.   **08**

Q.5   Answer the following.
    a)   What is Serializability? Explain Conflict Serializability in detail.   **08**
    b)   What is difference between having and where? Explain different group by   **08**
        functions with example.

Q.6   Answer the following.
    a)   What is distributed database? Explain Client/Server architecture of   **08**
        distributed databases.
    b)   Explain two-phase locking protocol with example.   **08**

Q.7   Answer the following.
    a)   What is trigger? When to use triggers. Explain with example.   **08**
    b)   Explain limitations of traditional file processing systems in detail.   **08**

Seat No.	

M.Sc. (Semester - I) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Data Structures and Algorithms (MSC18103)

Day & Date: Wednesday, 15-05-2024   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.3 to Q.7
           3) Figures to the right indicate full marks.

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

1) Which of this best describes an array?
   a) A data structure that shows a hierarchical behavior
   b) Container of objects of similar types
   c) Arrays are immutable once initialized
   d) Array is not a data structure

2) Is a pile in which items are added at one end and removed from the other.
   a) Stack   b) Queue
   c) List   d) None of the above

3) Binary search tree is an example of:
   a) Divide and conquer technique   b) Greedy algorithm
   c) Back tracking   d) Dynamic Programming

4) The time required to find shortest path in a graph with n vertices and e edges is:
   a) $O(e)$ b) $O(n)$
   c) $O(e^2)$ d) $O(n^2)$

5) If the elements "A", "B", "C" and "D" are placed in a stack and are deleted one at a time, what is the order of removal?
   a) ABCD   b) DCBA
   c) DCAB   d) ABDC

6) Linked list is considered as an example of _____ type of memory allocation.
   a) Dynamic   b) Static
   c) Compile time   d) Heap

7) A linear list in which each node has pointers to point to the predecessor and successors nodes is called as _____.
   a) Singly Linked List   b) Circular Linked List
   c) Doubly Linked List   d) Linear Linked List

8) The complexity of merge sort algorithm is _____.
   a) $O(n)$ b) $O(\log n)$
   c) $O(n2)$ d) $O(n \log n)$

9) _____ is non-linear data structure.
   a) Stack   b) Queue
   c) Linked List   d) None of these

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

B) Write True or False.   **06**
   1) Linear search is used for searching in a sorted or unsorted array.
   2) A graph is said to be complete if there is an edge between every pair of vertices.
   3) Queue works in FIFO.
   4) Linked list is non-linear data structure.
   5) The link component of each node is a pointer.
   6) Radix sort is the method used by card sorter?

Q.2 Answer the following.
   1) Explain bubble sort with example   **04**
   2) What is height balanced tree?   **04**
   3) What is searching? Explain binary search algorithm.   **04**
   4) What is primitives and non-primitive data type?   **04**

Q.3 Answer the following.
   a) Explain single and multidimensional array with suitable example.   **08**
   b) What is graph? Explain graph representation technique.   **08**

Q.4 Answer the following.
   a) What is queue? Explain operations on queue.   **08**
   b) Explain tree traversal algorithm with example.   **08**

Q.5 Answer the following.
   a) Write a program for implementation of stack.   **08**
   b) What is linked list? Explain types of linked list.   **08**

Q.6 Answer the following.
   a) Explain DFS traversal of graph.   **08**
   b) Explain radix sort algorithm with suitable example.   **08**

Q.7 Answer the following.
   a) Write an algorithm for converting prefix expression to postfix expression?   **08**
   b) Write an algorithm for inserting and deleting an element from singly linked list.   **08**

Seat No.

M.Sc. (Semester - I) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Software Engineering (MSC18109)

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. 10

1) If you were a lead developer of a software company and you are asked to submit a project/product within a stipulated time-frame with no cost barriers, which model would you select?
   a) Incremental   b) Spiral
   c) RAD   d) Waterfall

2) Requirement Analysis does not deal with _____ of the following diagrams.
   a) Use case   b) Activity diagram
   c) ER diagram   d) State transition

3) _____ is the incorrect testing technique.
   a) Integration testing b) System testing
   c) Unit testing   d) Collaboration testing

4) The most common form of project schedule is a _____.
   a) bar chart   b) Gantt chart
   c) pie chart   d) none of these

5) In size oriented metrics, metrics are developed based on the _____.
   a) amount of memory usage
   b) number of user inputs
   c) number of lines of code
   d) number of functions

6) Software mistakes during coding are known as _____.
   a) Bugs   b) Failures
   c) errors   d) defects

7) _____ one of the following is not a black box testing technique.
   a) Combinatorial testing
   b) Cause-effect (Decision Table) testing
   c) Boundary value testing
   d) Basic Condition testing

8) Unit testing is an example of _____ testing technique that is usually performed by the developer.
   a) Grey box   b) White Box
   c) Black Box   d) None of these

9) _____ of following is not a forms of abstraction mechanisms in software design.
   a) Functional abstraction   b) Data abstraction
   c) Control abstraction   d) Event abstraction

10) 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

B) State True or False.   **06**
   1) Spiral Model has user involvement in all its phases.
   2) Software costs more to maintain than it does to develop.
   3) Requirements Analysis is an Iterative Process.
   4) Reverse engineering and Re-engineering are equivalent processes of software engineering.
   5) In E-R diagram, Attribute is represented by Ellipse symbol.
   6) Software Debugging is a set of activities that can be planned in advance and conducted systematically.

Q.2   Write Short Note on.   **16**
   a) Write short note on requirements specification
   b) List the principles of a software design.
   c) Define Software Quality Control and Quality Assurance.
   d) Abstraction.

Q.3   Answer the following.   **16**
   a) What is Software Engineering? Explain waterfall model.
   b) What is DFD? Draw DFD for Railway Reservation Management System for level 0 and level 1.

Q.4   Answer the Following.   **16**
   a) Briefly Explain Software design process.
   b) Discuss about the software metrics for small organizations.

Q.5   Answer the following.   **16**
   a) What is Entity relationship diagram? Draw Entity relationship diagram for Library Management System.
   b) How can you design user interface? Explain.

Q.6   Answer the following.   **16**
   a) What is testing? Explain the different types of testing.
   b) "It is always advisable to identify and fix the bug during execution phase"- Justify this statement with suitable justification.

Q.7   Answer the following.   **16**
   a) Explain about object oriented analysis and design principle.
   b) What is the role of software architecture? Describe different software architecture styles.

Seat No.	

M.Sc. (Semester - I) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
UML (MSC18110)

Day & Date: Friday, 17-05-2024   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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) The packaging of an object with its behaviors is called _____.
   a) behaviors   b) attributes
   c) inheritance   d) encapsulation

2) Which diagram is used to show interactions between messages and classifiers as?
   a) Activity   b) State chart
   c) Collaboration   d) Object lifeline

3) Which of these are part of class operation specification format?
   a) Name   b) Parameter list
   c) Return_type list   d) All of these

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

5) What is a physical element that exists at runtime in UML?
   a) A node   b) An interface
   c) An activity   d) None of these

6) What are the different interaction diagram notations does UML have?
   a) a sequence diagram
   b) a communication diagram
   c) an interaction overview diagram
   d) all of the mentioned

7) _____ represented by In UML diagrams, relationship between components parts and object.
   a) ordination   b) aggregation
   c) segregation   d) increment

8) _____ diagram is time-oriented.
   a) Sequence   b) Collaboration
   c) Object diagram   d) None of the mentioned

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

10) Which kind of diagram shows aggregation?
   a) activity diagram   b) class diagram
   c) system sequence diagram   d) class relationship diagram

B) Write True/False 06

1) An object class is a set of object instances that share the same attributes and behavior.
2) Activity diagrams depict the sequential flow of a use case or business process.
3) The concept of multiplicity is essentially the same concept as cardinality in data modeling.
4) In deployment diagram communication paths are represented by dotted lines.
5) Use case diagram is a dynamic model of interaction between product and actors in a use case.
6) Structural Diagrams do not capture static aspects or structure of a system.

Q.2 Answer the following. 16
a) What is component? What are different kinds of components?
b) What is template class? How it is represented in UML?
c) What is structural model?
d) What is conceptual model of UML?

Q.3 Answer the following.
a) Explain structural things in UML. 08
b) What is package? Explain importing and exporting in packages. 08

Q.4 Answer the following.
a) Explain sequence diagram with example. 08
b) What are the advantages of UML? Explain the building blocks of UML. 08

Q.5 Answer the following.
a) Explain collaboration diagrams and activity diagrams with example. 08
b) Explain Use Case diagram with example. 08

Q.6 Answer the following.
a) Explain process and threads used in modeling techniques. 08
b) Explain behavioral things and grouping things in detail. 08

Q.7 Answer the following.
a) Explain generalization and specialization in detail with example. 08
b) Explain various phases of software development life cycle. 08

Seat No.

M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Java Programming (2318201)

Day & Date: Thursday, 09-05-2024   Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
                          2) Figure to right indicate full marks.

Q.1   A)   Choose correct alternative for the following.   08
   1)   Which of the following object used to show any number of choices in the visible window?
        a)   Labels   b)   Choice
        c)   List   d)   Checkbox

   2)   _____ are methods that must he overridden by subclasses.
        a)   default methods   b)   static methods
        c)   abstract methods   d)   hidden methods

   3)   The setBackground() method is part of which of the following class java.awt package?
        a)   Component   b)   Applet
        c)   Object   d)   Graphics

   4)   A _____ is a passive AWT control that do not generate any event.
        a)   Button   b)   RadioButton
        c)   Choice   d)   Choice

   5)   Which of these methods can be used to output a string in an applet?
        a)   display()   b)   print()
        c)   drawString()   d)   transient()

   6)   _____ keyword does not allow a method to be override in the subclass.
        a)   public   b)   final
        c)   abstract   d)   static

   7)   API stands for _____.
        a)   Application Programming Interchange
        b)   Application Programming Interaction
        c)   Application Programming Interface
        d)   Advance Programming Interface

   8)   Which of these packages contains all the classes and methods required for event handling interfaces?
        a)   java.lang   b)   java.awt
        c)   java.awt.event   d)   java.event

**   B)   State true or false: 04**
   1)   ActionEvent that gets generated when a button is clicked.
   2)   We can implement methods inside the interface.
   3)   AWT is used for GUI programming in java.
   4)   finalize() method is called before garbage collection.

Q.2 **Answer the following. (Any Six)** **12**
  a) Give any two uses of super keyword.
  b) What is bytecode?
  c) Differentiate between method overloading and method overriding.
  d) Give the need of thread priorities.
  e) Differentiate between throw and throws.
  f) Give the any four features of Java.
  g) What are the usages of Java Packages?
  h) Give the uses of 'this' keyword.

Q.3 **Answer the following. (Any Three)** **12**
  a) Explain Type-4 driver.
  b) What is an interface? List the rules to create an interface.
  c) Write a java program to implement multilevel inheritance with 4 levels of hierarchy.
  d) Explain applet life cycle with suitable diagram.

Q.4 **Answer the following. (Any Two)** **12**
  a) List and explain any four string methods.
  b) Demonstrate nested try statements with an example.
  c) List the difference between Abstract class and Interface

Q.5 **Answer the following. (Any Two)** **12**
  a) What is thread synchronization? Discuss with an example.
  b) Write a java program to read a file and copy, content of one file into another file.
  c) Discuss about JDBC architecture and explain in detail.

Seat
No.

M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Python Programming (2318202)

Day & Date: Saturday, 11-05-2024   Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Choose the correct alternatives from the given options.   **08**

1) What does the self-keyword represent in Python class methods?
   a) It represents the superclass
   b) It represents the subclass
   c) It represents the current object instance
   d) It represents the class itself

2) When is the finally block executed?
   a) when there is no exception
   b) when there is an exception
   c) only if some condition that has been specified is satisfied
   d) always

3) Which module in Python supports regular expressions?
   a) re   b) regex
   c) pyregex   d) None of the mentioned

4) Which of the following is not a declaration of the dictionary?
   a) {1: 'A', 2: 'B'}   b) dict([[1,"A"],[2,"B"]])
   c) {1,"A",2"B")   d) { }

5) How do you define an abstract class in Python?
   a) By using the abstract keyword
   b) By using the abstract class statement
   c) By importing the abc module and using @abstractmethod decorator
   d) By using the virtual keyword

6) Which Django file contains all the configuration of your Django installation?
   a) main.py   b) setting.py
   c) djangosetting.py   d) settings.py

7) To read the entire remaining contents of the file as a string from a file object infile, we use _____.
   a) infile.read(2)   b) infile.read()
   c) infile.readline()   d) infile.readlines()

8) Which widget are used to get the data from the user?
   a) Entry   b) Label
   c) Button   d) None of the above

B) Fill in the blanks. 04
1) MVC pattern is based on _____ components.
2) The assignment of more than one function to a particular operator is _____.
3) _____ model is import for numpy programming.
4) The ability to create new classes from existing ones is called _____.

Q.2 Answer the following. (Any Six) 12
a) What is canvas?
b) What is constructor? Give an example.
c) What is list? Give an example.
d) What is file? List modes of file.
e) What is bar graph?
f) What is thread synchronization?
g) What is class and object?
h) What is check button?

Q.3 Answer the following. (Any Three) 12
a) What is method overloading and method overriding?
b) Write a python program to check given number is prime or not by using function.
c) What is regular expression? Explain in detail with example.
d) What is tuple? Explain methods of tuple with example.

Q.4 Answer the following. (Any Two) 12
a) What is frame? Explain with example.
b) What is numpy? Explain the indexing and slicing with example.
c) Explain the data frame and series with example.

Q.5 Answer the following. (Any Two) 12
a) Write a python program to check given number is Armstrong or not by using GUI application.
b) What is inheritance? Explain the types of inheritance with example.
c) Explain the model, view and template in django with example.

Seat No.

M.Sc. (Semester - II) (New) (NEP CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Computer Communication Network (MSC18207)

Day & Date: Tuesday, 14-05-2024   Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
                  2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ).   08

1) _____ is not a function of network layer.
   a) congestion control   b) error control
   c) Routing   d) inter-networking

2) ____topology requires a multipoint connection.
   a) Ring   b) Star
   c) Mesh   d) Bus

3) _____ allows you to connect and login to a remote computer.
   a) SMTP   b) Telnet
   c) HTTP   d) FTP

4) The packet sent by a node to the source to inform it of congestion is called _____.
   a) Choke   b) Explicit
   c) Backpressure   d) Discard

5) Bluetooth is an example of _____.
   a) local area network   b) wide area network
   c) personal area network   d) virtual private network

6) _____ layer is responsible for process to process delivery in a general network model.
   a) data link layer   b) transport layer
   c) network layer   d) session layer

7) Application layer offers _____ service.
   a) End to end
   b) Process to process
   c) Both End to end and process to process
   d) None of the mentioned

8) The _____ field is used to detect errors over the entire user datagram.
   a) destination port   b) udp header
   c) checksum   d) source port

B) State True or False.   04

1) A collection of interconnected computers and devices that can communicate and share resources is called computer network.
2) TCP is called connectionless because all UDP packets are treated independently by transport layer.
3) HTTP protocol primarily used for browsing data.
4) A hub connects two different LANs.

Q.2   Answer the Following. (Any Six)   **12**
    a)   LAN
    b)   Applications of Computer Network
    c)   Flow Control
    d)   Circuit Switching
    e)   Uses of Internet
    f)   Ad hoc Network
    g)   IP Address
    h)   RPC

Q.3   Answer the following: (Any Three)   **12**
    a)   What are the functions of transport layer?
    b)   What is UDP? Explain.
    c)   Explain hierarchical routing algorithm.
    d)   Describe the structure and functions of e-mail protocol.

Q.4   Answer the following: (Any Two)   **12**
    a)   Differentiate between virtual circuits versus datagram subnet?
    b)   What is the need of Framing? Explain character stuffing and bit stuffing for framing?
    c)   Explain HTTP protocol in detail.

Q.5   Answer the following: (Any Two)   **12**
    a)   Explain the TCP/IP model of computer network with neat diagram.
    b)   What is congestion? Explain congestion control in virtual circuit subnet.
    c)   Describe Wide Area Network (WAN) and its components.

Q.1 A) Choose correct alternative. (MCQ)   08

1) In which one of the following codes with specific characteristics can be applied to the transmission?
    a) CDMA   b) GPRS
    c) GSM   d) All of the above

2) Which one of the following is considered as the GSM supplementary service?
    a) Emergency number   b) SMS
    c) Call forwarding   d) All of the above

3) GEO stands for _____.
    a) Geostationary Earth Orbit   b) Geographical Earth Orbit
    c) Geostructure Element Orbit   d) Geostructure Earth Orbit

4) Bluetooth is the wireless technology for _____.
    a) local area network   b) personal area network
    c) metropolitan area network   d) wide area network

5) What is the term used by ITU for a set of global standards of 3G systems?
    a) IMT 2000   b) GSM
    c) CDMA   d) EDGE

6) Which of the following are the components of WAP?
    a) Addressing model   b) WML
    c) WML Script   d) All the above

7) BSC comes under which of the following category?
    a) Operation   b) Radio
    c) Network   d) Mobile

8) WAP is _____ suite.
    a) Protocol   b) Message
    c) Security   d) None of the above

B) Fill in the blanks 04
1) _____ offers packet mode data transfer service over the cellular network.
2) _____ uses wireless as the mode of communication for transferring or exchanging data between various mobiles over a short-range.
3) The term "IMEI" stands for the _____.
4) PSTN stands for _____.

Q.2 Answer the following. (Any Six) 12
a) Define Roaming.
b) What are the types of Handoff?
c) What are the types of Wireless LAN?
d) What is Piconet?
e) Define Virtual Private Network.
f) Write the applications of Global Mobile Satellite System.
g) What is WLL?
h) Write any two Advanced techniques in Mobile Computing.

Q.3 Answer the following. (Any Three) 12
a) Write a Note on Network Signaling.
b) Write a Note on Mobile IP.
c) Write about the WML.
d) Write the Applications of Wireless LAN.

Q.4 Answer the following. (Any Two) 12
a) Write about the IMT 2000 (3G) Mobile Services and it Vision.
b) Draw and Explain GSM Architecture.
c) Write in details about the Bluetooth Technology.

Q.5 Answer the following. (Any Two) 12
a) Draw and explain the GPRS architecture.
b) Explain the Quality of Services (QoS) in 3G.
c) Explain the Global Mobile Satellite System.

Seat No.	

M.Sc. (Semester - II) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Java Programming (MSC18201)

Day & Date: Thursday, 09-05-2024   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.3 to Q.7
         3) Figures to the right indicate full marks.

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

1) What is the expansion of JVM?
   a) Java Vendor Machine   b) Java Virtual Machine
   c) Java Virtual Monitor   d) Java Virtual Memory

2) Instance of a class is called _____.
   a) member   b) object
   c) variable   d) field

3) The wait method method can be revived by using _____ method.
   a) yield()   b) notify()
   c) start()   d) paint()

4) A special member function inside the class and has the same name as class name is called _____.
   a) method   b) constructor
   c) object   d) property

5) Which of the following type of listener is used for handling button click events?
   a) MouseListener   b) ItemListener
   c) KeyListener   d) ActioneListener

6) _____ keyword does not allow a method to be override in the subclass.
   a) public   b) final
   c) abstract   d) static

7) The default priority of a thread is _____.
   a) 5   b) 10
   c) 15   d) 20

8) _____ method is used to register a keyboard event listener.
   a) KeyListener()   b) addKistener()
   c) addKeyListener()   d) eventKeyboardListener()

9) Which of the following is not access specifier in Java?
   a) private   b) public
   c) super   d) protected

10) Primitive types can be converted into object type using _____.
   a) Abstract class   b) Partial class
   c) Wrapper class   d) Static Class

B) **Write True or False.** 06
1) 'this' keyword in Java is used to create an instance of the class.
2) We can implement methods inside the interface.
3) A packages is a collection of classes and interfaces.
4) Static keyword does not allow a method to be override in the subclass.
5) Applets do not require a main() method.
6) executeQuery() method is used to perform DML statements in JDBC.

Q.2 **a)** **Write note on:** 08
i) Uses of static keyword
ii) Applet

b) **Attempt the following:** 08
i) Give the applications of Java.
ii) List Advantages of multithreading.

Q.3 **Answer the following:**
a) What is custom exception? Explain with example. 08
b) Explain Adapter Classes with its advantages. 08

Q.4 **Answer the following.**
a) Explain StringBuffer class using different methods. 08
b) Write an applet to accept a number and check a given number is prime or not. 08

Q.5 **Answer the following.**
a) What is constructor? Explain different types of constructors. 08
b) Write a java program to implement runnable interface with example. 08

Q.6 **Answer the following.**
a) Explain different types of statements in JDBC. 08
b) Write a program to copy one text file data into another text file. 08

Q.7 **Answer the following.**
a) What is polymorphism? Explain in detail with example. 08
b) Write a java program to implement multilevel inheritance with 4 levels of hierarchy. 08

Seat No.	

M.Sc. (Semester - II) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Python Programming (MSC18202)

Day & Date: Saturday, 11-05-2024   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.3 to Q.7.
　　　　　　　3) Figures to the right indicate full marks.

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

1) The _____ function is used to get user input in Python.
   a) read()   b) input()
   c) input_line()   d) get_input()

2) The _____ keyword is used to define a function in pthon.
   a) function   b) func
   c) define   d) def

3) The 'ranged()' function in Python generate a _____.
   a) list of numbers   b) tuple of numbers
   c) range object   d) dictionary

4) What is output of following code?
   a= [1,2,3]
   b=a
   b.append(4)
   print(a)
   a) [1,2,3]   b) [1,2,3,4]
   c) [1,2,4]   d) [1,3,4]

5) The purpose of the 'pass' statement in Python is _____.
   a) To terminate the program
   b) To create a loop
   c) To indicate a placeholder with no action
   d) To skip the current iteration in a loop

6) The correctly way to imports a module named 'my_module' and renames it to 'mm' in Python is _____.
   a) import mm as my_module
   b) import my_module as mm
   c) from my_module import mm
   d) import my_module and rename mm

7) To read the entire content of a file named 'example.txt' in Python is _____.
   a) read file('example.txt')   b) file.read('example.txt')
   c) open('example.txt').read()   d) read('example.txt')

8) The _____ exception is not a built-in exception in Python.
   a) FileNotFoundError   b) KeyError
   c) IndexError   d) ValueExceptionError

9) The _____ widget is used to display multiple lines of text in Tkinter.
   a) Message   b) Text
   c) Label   d) Entry

10) The purpose of the 'zip()' function in Python is _____.
   a) Unzips files and directories.
   b) Combines two or more iterables element-wise.
   c) Compresses folders.
   d) Converts elements to a zipped data format.

B) Fill in the blanks.   **06**
   1) The _____ method is used to add a new key-value pair to a dictionary in Python.
   2) The _____ method is used to check if a set is a subset of another set in Python.
   3) The _____ geometry/layout manager arranges widgets in a table-like structure in Tkinter.
   4) The _____ method is used to retrieve the value of an Entry widget in Tkinter.
   5) The _____ function is used to search for a pattern in a string using regular expressions in Python.
   6) The _____ method is used to run SQL queries on a database.

Q.2 Answer the following.   **16**
   a) Explain different string formatting techniques used in python. Give example of each.
   b) Write a python code to create dictionary perform add, remove, pop and update operations on it
   c) When do we encounter TypeError, ValueError and IndexError? Give example.
   d) Discuss why Python is called as dynamic and strongly typed language?

Q.3 Answer the following:
   a) What is use of bind method? Explain bind method with example.   **08**
   b) What is multi-threading? How to create a thread? Explain with example.   **08**

Q.4 Answer the following.
   a) What is the need of regular expressions in programming? Discuss the following methods supported by compiled regular expression objects.
      a) search()   b) findall()   **08**
   b) What are different types of parameters used in python? Explain variable-length parameters with example.   **08**

Q.5 Answer the following.
   a) How will you add an index, resetindex, row and column to a DataFrame? Explain with example.   **08**
   b) How do we achieve code reusability in python? Explain code reusability with example.   **08**

Q.6 Answer the following.
   a) Write a Python program to count the frequency of each word in a file and draw bar chart of word and its frequency.   **08**
   b) How do we access parent members in the child class? Explain with an example.   **08**

Q.7 **Answer the following.**

a) How to connect mysql database using python? How to perform DML operation on database? Explain with example. **10**

b) What is the common run-time error faced while opening a file? How do you handle it? Explain with example. **06**

Seat No.

Set **P**

M.Sc. (Semester - II) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Computer Communication Network (MSC18207)

Day & Date: Tuesday, 14-05-2024   Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

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

1) In OSI model, _____ layer provides dialog control and token management.
   a) session   b) network
   c) data link   d) transport

2) ICMP is mainly used for _____.
   a) addressing   b) routing
   c) error and diagnostic functions   d) forwarding

3) _____ is more likely to occur during the frame transmission in Stop-and-Wait ARQ mechanism.
   a) Normal operation
   b) Delay in an acknowledgement
   c) Loss of frame or an acknowledgement
   d) All of the above

4) 125.8.200.1 IP address belongs to _____.
   a) Class C   b) Class A
   c) Class D   d) Class B

5) Token bucket algorithm is used to shape the bursty traffic into fixed rate traffic by averaging the data rate.
   a) Token bucket   b) Routing
   c) Congestion   d) None of these

6) SMTP uses _____ TCP port.
   a) 21   b) 22
   c) 25   d) 23

7) In _____ routing algorithm operates by having each router maintain a table giving the best known distance to each destination and which link to use to get there.
   a) distance vector   b) link state
   c) hierarchical   d) broadcast

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

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

10) The network layer is concerned with _____ of data.
    a) bits   b) frames
    c) bytes   d) packets

B) State True or False.   06
    1) In broadcasting, packet sends simultaneously to all destinations.
    2) The variation in the packet arrival times is called jitter.
    3) If routing information is automatically updated by routers when network
        configuration changes is called static routing.
    4) HTTP is not an application layer protocol.
    5) In optimality principle, every incoming packet is sent out on every
        outgoing line except the one it arrived on.
    6) In ARP, physical address is found for a given logical address.

Q.2 Answer the Following.   16
    a) POP
    b) IP
    c) Internetwork
    d) Flooding

Q.3 Answer the following:
    a) What is Computer Network? Explain different uses of computer network.   08
    b) Explain Store and Forward packet switching method.   08

Q.4 Answer the following:
    a) Explain LAN, MAN and WAN in detail.   08
    b) What is Routing and explain any two Routing algorithms in detail.   08

Q.5 Answer the following:
    a) What is TCP? Explain in detail.   08
    b) Explain congestion control in detail.   08

Q.6 Answer the following:
    a) Explain different services provided by the Transport layer.   08
    b) Explain DNS in detail.   08

Q.7 Answer the following
    a) Explain HTTP in detail.   08
    b) Distinguish between virtual circuit and datagram subnet in detail.   08

Seat No.

M.Sc. (Semester - II) (Old) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Artificial Intelligence (MSC18208)

Day & Date: Tuesday, 14-05-2024 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

Q.1 A) Choose the correct alternative. 10

1) 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) Semantic net b) Scripts
   c) Frames d) Conceptual dependency

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

3) "He lifted the beetle with red cap" contain which type of ambiguity?
   a) Lexical ambiguity b) Referential ambiguity
   c) Syntax Level ambiguity d) None of the Above

4) The most recently created state from which alternative moves are available will be revisited & new state is created is called _____
   a) Backtracking b) Chronological Backtracking
   c) Futility limit d) Cut

5) The ability to manipulate the representational structure in such a way as to derive new structure from old is called as _____
   a) Representational Adequacy
   b) Inferential Adequacy
   c) Inferential Efficiency
   d) Acquisitional Efficiency

6) MYCIN uses _____ reasoning techniques.
   a) Forward b) Bidirectional
   c) Backward d) None of these

7) 8-puzzle is a _____ problem.
   a) Ignorable b) Irrecoverable
   c) Recoverable d) None of the above

8) _____ of the following is an application of AI.
   a) Gaming b) Expert systems
   c) Vision system d) All of the above

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

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

B) State True or False. **06**
  1) Forward Chaining systems are Data-driven, whereas backward chaining systems are goal-driven.
  2) Frames attempts to show that the negation of the statement produces a contraction with the known statements.
  3) MYCIN is a program that diagnoses infectious diseases.
  4) Alpha-beta pruning is a modified version of the minimax algorithm.
  5) Expert System is the study of how to make computer do things which at the moment people can do better.
  6) General algorithm applied on game tree for making decision of win/lose is DFS/BFS Search Algorithms.

Q.2 Answer the Following. **16**
  a) Fuzzy logic
  b) ELIZA
  c) Semantic Analysis
  d) Expert system

Q.3 Answer the following:
  a) What is Artificial Intelligence? Explain Formal and Mundane tasks. **08**
  b) Explain Depth-First Search algorithm in detail. **08**

Q.4 Answer the following:
  a) Explain water jug problem. **08**
  b) Explain Best-First Search algorithm in detail. **08**

Q.5 Answer the following:
  a) What is Frame problem? Explain in detail. **08**
  b) Explain semantic network with one example in detail. **08**

Q.6 Answer the following:
  a) Explain forward and backward reasoning techniques in detail. **08**
  b) Explain Bayes theorem in detail. **08**

Q.7 Answer the following
  a) Explain different characteristics of an AI Problem. **08**
  b) What is conceptual dependency? Explain in detail. **08**

Seat No.

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Digital Image Processing (MSC18301)

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) Figures to the right indicate full marks.

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

1) The difference between two sets A and B is given by _____.
   a) $A - B = \{ w/w \in A, w \notin B \}$
   b) $A - B = \{ w/w \in B, w \notin A \}$
   c) $A - B = \{ w/w \in B, w \in A \}$
   d) None of these

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

3) _____ procedure is used to obtain images of blood vessels.
   a) PET   b) Angiography
   c) Lithography   d) None of these

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

5) An image is represented by $f(x, y)$. The values x, y and f are all _____.
   a) zero   b) finite
   c) infinite   d) either finite or infinite.

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

7) DFT stands for _____
   a) Digital Fourier Transform   b) Discrete Fourier Table
   c) Discrete Fourier Transform   d) Digital Fourier Table

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

9) _____ processing techniques of image enhancement are based on modifying the Fourier transform of an image.
   a) Frequency domain   b) Spatial domain
   c) both a and b   d) None of these

10) The Hit-or-Miss transformation is defined in terms of _____ structuring elements.
 a) zero
 b) one
 c) two
 d) none of these

B) State whether True or False. 06
 1) Mathematically morphology is graph theory.
 2) Creation of new pixels is the first step in zooming digital image.
 3) The Hit-or-Miss transformation does not require structuring elements.
 4) Dilation followed by erosion is called opening.
 5) Segmentation should stop when the objects of interest in an application have been isolated.
 6) In Z^3 two are the coordinates and the third component is intensity.

Q.2 Write short notes on the following. 16
 a) Dilation operation
 b) Histogram processing
 c) Boundary extraction
 d) Detection of discontinuities

Q.3 Answer the following.
 a) What is image averaging? What is the use of image averaging? 08
 b) What are the steps involved in filtering in the frequency domain? 08

Q.4 Answer the following.
 a) What are the components of digital image processing system? 08
 b) Explain the probability density function Gaussian Noise. 08

Q.5 Answer the following.
 a) Explain the following morphological algorithms -
  i) Boundary extraction ii) Thinning 08
 b) Explain the Hit-or-Miss transformation. 08

Q.6 Answer the following.
 a) What is electromagnetic spectrum? Explain any three fields that use digital image processing. 08
 b) What are the three types of lowpass filters? Explain Ideal lowpass filter. 08

Q.7 Answer the following.
 a) What are the three basic types of gray-level transformations? Describe. 08
 b) What are the steps involved digital image processing? 08

Seat No.	

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Open Source Technologies (PHP, MySql) (MSC18302)

Day & Date: Monday, 13-05-2024   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 _____ symbol is used to declare variables in PHP.
    a) @   b) &
    c) #   d) $

2) What is output of following code?
    ```php
    <?php
        $a = 5;
        $b = 10;
        print ("$a, $b+10");
    ?>
    ```
    a) 520   b) 5,20
    c) 5 10+10   d) 5, 10+10

3) The function converts a string of ASCII characters to hexadecimal values.
    a) bin2hex()   b) str2hex()
    c) hex()   d) ascii2_hex()

4) What will be the output of the following PHP code?
    ```php
    <?php declare(strict_types = 1);
        function details (string $name, int $age){
            echo "Name: $name, Age: $age";
        }
        details("Alvin", "21");
    ?>
    ```
    a) Name: Alvin, Age: 21   b) Name: Alvin, Age: 0
    c) Name: Alvin, Age: d) Fatal Error

5) _____ is the correct example of an Indexed array in PHP.
    a) $cities = array ("Delhi"; "Mumbai"; "Bangalore");
    b) $cities = array ("Delhi", "Mumbai", "Bangalore");
    c) $cities = new array ("Delhi", "Mumbai", "Bangalore");
    d) $cities = new array (3) ("Delhi", "Mumbai", "Banglore");

6) _____ is the correct way of defining function with return type in PHP.
   a) function function_name(type $arguments) : return_type { /* function body*/ }
   b) function function_name(type $arguments), retum_type { /* function body*/ }
   c) retum_type function function_name(type $arguments) { /* function body*/ }
   d) function return_type function_name(type Sarguments) { /* function body*/ }

7) _____ is the correct syntax of PHP "include" statement.
   a) include {'filename'};   b) <include 'filename'>;
   c) include <'filename'>;   d) include 'filename';

8) The _____ keyword is used to prevents a method from being overridden by a subclass.
   a) super   b) final
   c) static   d) sealed

9) The _____ method is used to retrieve data from a MySQT. database in PHP.
   a) fetch_row()   b) get_result()
   c) mysql_fetch_array()   d) mysqli get data()

10) The _____ PHP function is used to retrieve the error code associated with the MySQT.
   a) get_error_code()   b) mysqli_errno()
   c) pdo_get_error()   d) error_code()

B) Fill in the blanks. 06
1) The _____ function is used to set a cookie in PHP.
2) The _____ keyword in PHP is used to access a parent class methods within a derived class.
3) The _____ magic method is automatically called when an object is destroyed in PHP.
4) The _____ HTTP method appends data to the URL in PHP.
5) To sort multi-dimensional arrays in PHP, _____ function is used.
6) The _____ function is used to destroy a session in PHP.

Q.2 Answer the following. 16
a) Explain differentiate between "include" and "require" in PHP with example.
b) What is Client-Side Scripting and Server-Side Scripting? Explain its advantages and disadvantages.
c) Describe the difference between "==" and "===" operators with example in PHP.
d) Explain different steps to create website using Joomla.

Q.3 Answer the following.
a) What is exception handling? Explain how to catch and handle different types of exceptions efficiently in a PHP with examples.   10
b) Write PHP script to read formatted file and write it into another file.   06

Q.4 **Answer the following.**
    a) What is difference between array and associative? Explain how to create associative array with example.   **08**
    b) What is inheritance? Explain how to call base class constructor in derived class using example.   **08**

Q.5 **Answer the following.**
    a) Explain any 4 helper functions with example.   **08**
    b) Explain different operators used in PHP.   **08**

Q.6 **Answer the following.**
    a) What is recursive function? Write PHP program for Fibonacci series and factorial number using recursive unction.   **08**
    b) What is cookie? Explain how to handles cookies with example.   **08**

Q.7 **Answer the following.**
    a) Write PHP script for database manipulation.   **10**
    b) How to create constructor and destructor in PHP? Explain with example.   **06**

Seat No.		**Set**	**P**

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Network Security (MSC18307)

Day & Date: Wednesday, 15-05-2024   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 the correct alternative. (MCQ)   **10**

1) The process of converting plaintext to cipher text is known as _____.
    a) Encryption   b) Decryption
    c) Deciphering   d) None of these

2) Digital signature provides _____.
    a) Authentication   b) Non-repudiation
    c) Both a and b   d) None of these

3) _____ means the receiver is ensured that the message is coming from the intended sender.
    a) Message confidentiality   b) Message integrity
    c) Message authentication   d) Message content

4) In public key cryptography, _____ key that encrypts the message.
    a) Public key   b) Unique key
    c) Private key   d) Security key

5) _____ methods used to prove that a user has access right to the data or resources owned by a system.
    a) Digital Signature   b) Authentication
    c) Access control   d) Routing Control

6) Secure Socket Layer is a predecessor of which cryptographic protocol?
    a) IPSec   b) Transport Layer Security
    c) SSH   d) HTTPS

7) Which of the following type of attack can actively modify communication or data?
    a) Passive attack   b) Active attack
    c) Both a & b   d) None of these

8) TLS was derived from a security protocol called _____.
    a) SSL   b) SET
    c) PGP   d) MIME

9) _____ ensures the integrity and security of data that are passing over a network.
    a) Firewall   b) Antivirus
    c) Network Security Protocols   d) None of these

10) Pretty good privacy (PGP) is used in _____.
    a) browser security   b) email security
    c) FTP security   d) wifi security

B) Fill in the blanks. **06**
1) Passive attack means _____.
2) SSL primarily focuses on _____.
3) _____ is a set of protocols used to provide authentication, data integrity and confidentiality between two machines in an IP network.
4) One security protocol for the e-mail system is _____.
5) DES stands for _____.
6) The objectives of network securities are _____.

Q.2 Answer the following. **16**
a) Give the differences between passive and active security threats.
b) What is mean by cryptographic authentication?
c) Explain LDAP with its advantages.
d) Explain the different security goals.

Q.3 Answer the following.
a) Explain Network Security Architectures in details. **08**
b) Briefly explain the principles of symmetric ciphers. **08**

Q.4 Answer the following. **16**
a) Briefly explain digital signature and non-repudiation.
b) What are the uses of Firewall? Explain in detail application firewall.

Q.5 Answer the following. **16**
a) Explain RSA algorithm in detail with an example.
b) Briefly explain packet filtering.

Q.6 Answer the following. **16**
a) Explain the concept of SSL with its architecture.
b) Briefly explain Non-Interference and Role Base Model in Access Control Mechanisms.

Q.7 Answer the following. **16**
a) State and explain the principles of public key cryptography.
b) Briefly explain intrusion detection and prevention system.

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Cloud Computing (MSC18308)

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) Cloud computing is the _____ availability of computer system resources, especially data storage and computing power, without direct active management by the user.
   a) On-network   b) On-switch
   c) On-demand   d) On-router

2) NIST stands for _____.
   a) National Institute of Sources and Timings
   b) National Institute of Solutions and Terminology
   c) National Institute of Software and Testing
   d) National Institute of Standards and Technology

3) Amazon Web Services mainly offers _____, which in the case of its EC2 service means offering Virtual Memories with a software stack.
   a) Netflix as a Service
   b) Infrastructure as a Service
   c) Prime Video as a Service
   d) None of the above

4) The client can deploy its applications on the cloud infrastructure or use applications that were programmed using languages and tools that are supported by the _____ service provider.
   a) Infrastructure   b) Platform
   c) Application   d) Hardware

5) A software layer, the _____, mediates access to the physical hardware presenting to each guest operating system a virtual machine, which is a set of virtual platform interfaces.
   a) Hyper tuner   b) Operating System
   c) Hypervisor   d) User Interface

6) With _____, the customer uses the application as needed and is not responsible for the installation of the application, its maintenance, or its upkeep.
   a) Microsoft as a Service   b) Software as a Service
   c) Application as a Service   d) Hardware as a Service

7) _____, an example of Platform as a Service, offers a scalable environment for developing and hosting Web applications.
   a) VMware
   b) Google App Engine
   c) Amazon Machine Images
   d) Kernel-based Virtual Machine

8) ____cloud as internal data center of a business or other organization, not made available to the general public.
   a) Hybrid
   b) Modest
   c) Private
   d) Hyper

9) _____access to resources has been perceived as one the most attractive features of clouds.
   a) Professional
   b) Self-service
   c) Non-Professional
   d) Debug

10) In a _____ cloud a great disparity between user needs is often the case. Thus, resources rented from the cloud must be highly customizable.
    a) Multi-Service
    b) Multi-Tenant
    c) Multi-Developer
    d) Multi-Programmer

B) State True or False.   06
   1) Cloud Computing represents an advance in the field of computing technology where management of computing services is not outsourced to greater extents and in single dimensions.
   2) IT enterprises whose sole business interest is developing applications are bound to setup computing infrastructure before they start any development work.
   3) The bottom layer or the foundation is the 'computing infrastructure' facility.
   4) In computing, platform is the underlying system over which applications run.
   5) A IT admin actually works on the application layer while he or she is going to edit a document, play a game or use the calculator in a computer.
   6) Cloud resides at some remote location and does all the heavy computing tasks, the hardware and software demand on the local computers at users' side decrease.

Q.2 Answer the following.   16
   a) What do you mean by Computing?
   b) What is Intranet and Internet?
   c) Explain in brief Web Services.
   d) What is Hybrid Cloud?

Q.3 Answer the following.
   a) Define Cloud Computing. Explain in detail characteristics of Cloud Computing.   08
   b) What is IaaS? State and explain in detail various approaches of IaaS.   08

Q.4 Answer the following.
   a) State and explain in detail Service Oriented Architecture with example.   08
   b) State and explain various Cloud Deployment Model.   08

Q.5 **Answer the following.**
   a) What do you mean by Hypervisors? Explain in detail approaches of virtualization?   **08**
   b) State and explain Software as a Service (SaaS) with suitable example.   **08**

Q.6 **Answer the following.**
   a) What is PaaS? State and explain characteristics of Google App Engine?   **08**
   b) State and explain in detail Application-level security with example.   **08**

Q.7 **Answer the following.**
   a) Discuss in detail differences between on-premises versus cloud computing system?   **08**
   b) What do you mean by Web 2.0? State and explain key benefits of Web 2.0.   **08**

Seat No.	

Set **P**

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Mobile Computing (MSC18309)

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) Choose the correct alternatives.   **10**

1) A scatter net can have maximum _____.
    a) 10 piconets   b) 20 piconets
    c) 30 piconets   d) 40 piconets

2) Bluetooth supports _____.
    a) point-to-point connections
    b) point-to-multipoint connection
    c) both point-to-point connections and point-to-multipoint connection
    d) multipoint to point connection

3) Bluetooth is the wireless technology for _____.
    a) local area network
    b) personal area network
    c) metropolitan area network
    d) wide area network

4) Which of the following is not an application of third generation network?
    a) Global Positioning System (GPS)
    b) Video conferencing
    c) Mobile TV
    d) Downloading rate up to 1 Gbps

5) What is the term used by ITU for a set of global standards of 3G systems?
    a) IMT 2000   b) GSM
    c) CDMA   d) EDGE

6) Which of the following are the components of WAP?
    a) Addressing model   b) WML
    c) WML Script   d) All the above

7) _____language assisted in creating pages delivering WAP data?
    a) Wireless markup language
    b) Wired markup language
    c) HTML
    d) Both a and b

8) Why wireless communication is used?
   a) It enables billions of people to connect to the Internet
   b) Lowers the cost of network infrastructure
   c) Makes services more inexpensive
   d) All of the mentioned

9) BSC comes under which of the following category?
   a) Operation   b) Radio
   c) Network   d) Mobile

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

B) State True or False.   **06**
   1) _____ offers packet mode data transfer service over the cellular network.
   2) _____ uses wireless as the mode of communication for transferring or exchanging data between various mobiles over a short-range.
   3) The term "VLR" stands for the _____.
   4) _____ is a satellite based wireless personal communication network designed to permit any type of telephone transmission (voice and data).
   5) CDMA2000 is a family of _____ mobile technology standards.
   6) PSTN stands for _____.

Q.2 Answer the following.   **16**
   a) Explain Network Signaling in GSM.
   b) Write the Advantages of Wireless LAN.
   c) Write short note on Wideband Code Division Multiple Access (W-CDMA).
   d) Write short note on WAP Gateway.

Q.3 Answer the following.   **16**
   a) Explain the functional architecture of GSM.
   b) Explain mobility management in GSM.

Q.4 Answer the following.   **16**
   a) Explain the GPRS architecture.
   b) What is Wireless Local Loop (WLL).Explain it's Architecture.

Q.5 Answer the following.   **16**
   a) Explain the Quality of Services (QoS) in 3G.
   b) Explain the different types of Global Mobile Satellite Systems.

Q.6 Answer the following.   **16**
   a) Explain the Bluetooth technology and protocols.
   b) Explain the architecture of IEEE 802.11 standard.

Q.7 Answer the following.   **16**
   a) Write about the IMT 2000 (3G) Mobile Services.
   b) Explain the case study for GLOBALSTAR system.

Seat No.

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
. Net Technology (MSC18401)

Day & Date: Thursday, 09-05-2024　　　　　　　　　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) Figures to the right indicate full marks.

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

1)　C# runs on the _____.
　　a)　.NET Framework　　　　b)　Java Virtual Machine
　　c)　Both a and b　　　　　　d)　None of the above

2)　What is CLR in C#?
　　a)　It is a virtual machine component of Microsoft .NET Framework
　　b)　It is a virtual machine component of JVM
　　c)　It is a compiler to compiler the C# code
　　d)　All of the above

3)　What is the full form ASP?
　　a)　Access Server Pages　　　　b)　Active Service Pages
　　c)　Active Server Pages　　　　d)　Access Service Pages

4)　Which term is used for pages that depend on the Master page?
　　a)　Master Pages　　　　　　b)　Content Pages
　　c)　Web Pages　　　　　　　d)　None of the above

5)　Which file contains the Application_Start event?
　　a)　Global.asax　　　　　　b)　Web.config
　　c)　Local.asax　　　　　　　d)　None of the above

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

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

8)　What is the file extension of Webservices in ASP.Net?
　　a)　.aspx　　　　　　　　　b)　.asp
　　c)　.asm　　　　　　　　　d)　.asmx

9)　Which is/are the component(s) of ADO.NET?
　　a)　Data Adaptor　　　　　　b)　Command
　　c)　Connection　　　　　　　d)　All of the above

10) Which of the following property is used to get cookies value in ASP.NET?
    a) Response.Cookies["cookiename"].GetValue
    b) Response.Cookies["cookiename"].CookieValue
    c) Response.Cookies["cookiename"].GetCookieValue
    d) Response.Cookies["cookiename"].Value

B) Write True OR False.   06
1) C# is a structured programming language.
2) The IIS is a web server, which is used to deploy web applications.
3) C# programming language is not case-sensitive.
4) ASP.Net web application can run without web.config file.
5) CheckBox is a server-side control in ASP.NET.
6) The cookies are stored on Cache Memory.

Q.2 Write short note on the following.   16
  a) Namespace
  b) HTTP Handler & Modules
  c) Common Language Runtime
  d) COM and COM+

Q.3 Answer the following.
  a) Write difference between ASP & ASP.Net.   08
  b) Why boxing & unboxing? Justify with example.   08

Q.4 Answer the following.
  a) What is validation? Explain custom validation with example.   08
  b) What is namespace? How to create and use namespace in .NET?   08

Q.5 Answer the following.
  a) Explain delegate with example.   08
  b) What is .NET? Explain ASP.NET Page Life Cycle.   08

Q.6 Answer the following.
  a) Explain page structure options in ASP.NET in detail.   08
  b) Write detail description on Microsoft .NET framework.   08

Q.7 Answer the following.
  a) What is the use of Session in ASP.NET? Explain with example.   08
  b) What is master page? How to select dynamically master page in ASP.NET application?   08

Seat No.	

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Machine Learning (MSC18402)

Day & Date: Saturday, 11-05-2024   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) Fill in the blanks by choosing correct alternatives given below.   **10**

1) An _____ is a sequence of instructions that should be carried out to transform the input to output.
     a) Machine   b) Algorithm
     c) User   d) Admin

2) Application of machine learning methods to large databases is called _____ mining.
     a) Knowledge   b) Information
     c) Intelligence   d) Data

3) _____, which is finding associations between products bought by customers.
     a) Store analysis   b) Retail analysis
     c) Basket analysis   d) Stock analysis

4) _____ learning is programming computers to optimize a performance criterion using example data or past experience.
     a) Computer   b) Machine
     c) Instruction   d) Performance

5) In _____ learning, the aim is to learn a mapping from the input to an output whose correct values are provided by a supervisor.
     a) Supervised   b) Unsupervised
     c) Machine   d) Data

6) _____ where the aim is to find groupings of input.
     a) Classification   b) Clustering
     c) Colony   d) Collateral

7) A robot navigating in an environment in search of a goal location is another application area of _____ learning.
     a) Reinvestment   b) Humanoid
     c) Reinforcement   d) Robot

8) _____ is a method that operates by constructing multiple decision trees during the training phase.
     a) SVM   b) Bayes
     c) Decision Trees   d) Random Forest

9) A regression equation problem with multiple input variables is called _____ regression problem.
     a) Univariate   b) Covariate
     c) Quadravariate   d) Multivariate

10) _____ error is the difference between proposed model's average prediction and proper value developers are attempting to forecast.
   a) Sum of Square   b) Variance
   c) Standard deviation   d) Bias

B) Write True or False.   **06**
1) In unsupervised learning, there is no such supervisor and we only have input data.
2) Information gain is a measure of randomness or unpredictability in the dataset.
3) Regression is a task of predicting continuous quantities.
4) Overfitting is the model in which an algorithm can neither learn the relationship between variables in the data nor predict or classify new data points.
5) A Logistic regression is a method used to predict a dependent variable, given a set of independent variables, such that the dependent variable is categorical.
6) The Single Value Decomposition is applicable only for real value matrices of fixed size.

Q.2 Answer the following.   **16**
  a) What do you mean by Classification?
  b) What is Reinforcement learning?
  c) What do you mean by PCA?
  d) What is Artificial Intelligence?

Q.3 Answer the following.
  a) Discuss in detail Markov Decision Process to find the shortest path with minimum possible cost?   **08**
  b) Explain in detail the K-Means Clustering algorithm with suitable example?   **08**

Q.4 Answer the following.
  a) Define Machine Learning. Explain in detail the general steps and process of Machine Learning?   **08**
  b) State and explain the difference between Supervised and Unsupervised Learning.   **08**

Q.5 Answer the following.
  a) What is Naïve Bayes Theorem? Explain how to find probability of event using Bayes Theorem with suitable example?   **08**
  b) What is Dimension Reduction? What is the use of Dimension Reduction in Machine Learning?   **08**

Q.6 Answer the following.
  a) Discuss in detail Association Rule Learning algorithm with suitable example?   **08**
  b) What is KNN algorithm? Explain in detail KNN algorithm steps with suitable example?   **08**

Q.7 Answer the following.
  a) What is Regression? Explain Linear regression with suitable example?   **08**
  b) What are the various applications of Machine Learning?   **08**

Seat No.

Set **P**

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Data Warehouse and Mining (MSC18403)

Day & Date: Tuesday, 14-05-2024   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) Multiple choice questions.   **10**

1) The snowflakes scheme consists of multiple fact tables.
    a) True   b) False

2) The partition of an overall data warehouse is _____.
    a) Data Mart   b) Database
    c) Data Cube   d) All of these

3) Metadata describes _____.
    a) contents of the database
    b) structure of contents of the database
    c) structure of the database
    d) Database Itself

4) K-nearest neighbour is one of the _____.
    a) learning technique   b) OLAP tool
    c) purest search technique   d) data warehousing tool

5) KDD describes the _____.
    a) the whole process of extraction of knowledge from data
    b) extraction of data
    c) extraction of information
    d) extraction of rules

6) _____ is the first stage in the genetic algorithm.
    a) evaluation of each string.
    b) selection of string.
    c) creation of a population of string.
    d) genetic manipulation

7) Data mining is used to refer _____ stage in knowledge discovery in a database
    a) selection   b) retrieving
    c) discovery   d) coding

8) Background knowledge depends on the form of
    a) theoretical knowledge   b) hypothesis
    c) formulae   d) knowledge representation

9) _____ add the information from the operational database.
    a) replication technique   b) reengineering technique
    c) engineering technique   d) transformation engineering

10) _____ of the following is categorized as a descriptive model.
   a) Classification   b) Regression
   c) Sequence discovery   d) Prediction

B) Fill in the blanks.   **06**
   1) The cuboid that holds the lowest level of summarization is called _____.
   2) The star schema is composed of _____ fact table.
   3) The _____ operation is used for reducing the data cube by one or more dimensions.
   4) _____ is the first stage in the KDD process.
   5) Association rules are always defined on _____.
   6) _____ analysis divides data into groups that are meaningful, useful or both.

Q.2 Answer the following.   **16**
   a) What is the difference between a database and a data warehouse?
   b) Why there is a need for data mining?
   c) Write a short note on Data Marts.
   d) Write a short note on Market basket analysis.

Q.3 Answer the following.   **16**
   a) Explain data warehouse architecture in detail.
   b) What is classification? Explain different issues regarding classifications.

Q.4 Answer the following.   **16**
   a) How frequent pattern is mined? Explain in detail.
   b) Explain components of data warehousing.

Q.5 Answer the following.   **16**
   a) What is meant by Supervised learning? Explain with a suitable example.
   b) Explain the Bayesian classification algorithm with a suitable example.

Q.6 Answer the following.   **16**
   a) Explain data visualization in detail.
   b) What are the different major issues in data mining? Explain in detail.

Q.7 Answer the following.   **16**
   a) What is Data cleaning? Explain in detail.
   b) Explain data mining query with its techniques and example.

Seat No.

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2024
COMPUTER SCIENCE
Soft Computing (MSC18409)

Day & Date: Thursday, 16-05-2024   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) Figures to the right indicate full marks.

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

1) The fundamental unit of network is
   a) Brain   b) Nucleus
   c) Neuron   d) Axon

2) Learning is a?
   a) slow process   b) Fast process
   c) Can be slow or fast in general   d) Can't say

3) Activation models are?
   a) Dynamic   b) Static
   c) Deterministic   d) None of the mentioned

4) What does FAM stand for?
   a) Fuzzy Association memory
   b) Fuzzy Associative memory
   c) Fuzzy assist memory
   d) None of the above

5) Which of the following is the best representation of individual genes?
   a) Coding   b) Conversion
   c) Encoding   d) None of the above

6) Which of the following is considered while determining the nature of the learning problem?
   a) Problem   b) Feedback
   c) Environment   d) All of the above

7) Automated vehicle is an application of _____
   a) Unsupervised learning
   b) Supervised learning
   c) Reinforcement learning
   d) Active learning

8) Which of the following is true for unsupervised learning?
   a) Some specific output values are disclosed
   b) Some specific output values aren't disclosed
   c) No relevant inputs value is specified
   d) Both inputs as well outputs are specified

9) What is the name of the network, which includes backward links from the output to the inputs as well as the hidden layers?
   a) Perceptron   b) Self-organizing maps
   c) Multi-layered perceptron   d) Recurrent neural network

10) Backpropagation can be defined as _____
   a) It is another name given to the curvy function in the perceptron.
   b) It is the transmission of errors back through the network to adjust the inputs.
   c) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn.
   d) None of the above

B) State True or False.   **06**
   1) Neural networks learn by example.
   2) McCulloch-pitts model have ability of learning.
   3) In soft computing the output doesn't remains same when we train of same data, whereas in case of hard computing the output will always remain the same.
   4) Neural networks can be simulated on the conventional computers
   5) Fuzzy logic deals with linguistic variables.
   6) Traditional set theory is also known as Crisp Set theory.

Q.2 Answer the following.   **16**
   a) Classify different activation functions of Neural Networks.
   b) What are the different characteristics of Neural Networks?
   c) What are the different properties of fuzzy sets?
   d) Explain single layer Neural Network architecture.

Q.3 Answer the following.   **16**
   a) Explain Binary encoding of Genetic algorithm with example.
   b) Explain fuzzy relations with suitable example.

Q.4 Answer the following.   **16**
   a) Explain Roulette Wheel Selection in detail.
   b) Explain Input, Hidden and Output layer and its applicability in NN.

Q.5 Answer the following.   **16**
    a)   Explain Steepest descent method.
    b)   Calculate the Max-Min composition for following fuzzy relation
       R= {0.5/10 + 0.7/20 + 0.2/30 + 0.9/40},
       S= {0.4/10 + 0.1/20 + 0.8/30 + 0.6/40}

Q.6 Answer the following.   **16**
    a)   Explain crossover and mutation operators of GA.
    b)   The task is to recognize English alphabetical characters (E, F, X, Y, I, T) in an image processing system. Define two fuzzy sets I and F to represent the identification of characters I and F.
       I = {(F, 0.4), (E, 0.3), (X, 0.1), (Y, 0.1), (I, 0.9), (T, 0.8)}
       F = {(F, 0.99), (E, 0.8), (X, 0.1), (Y, 0.2), (I, 0.5), (T, 0.5)}
       Find the following:
       i) IUF
       ii) I – F

Q.7 Write The followings: **16**
    a)   Explain different learning methods.
    b)   Explain feed forwarded neural network.

Seat No.	

M.Sc.(Semester - IV) (New) (CBCS) Examination : March/April-2024
COMPUTER SCIENCE
Block chain Technology (MSC18410)

Day & Date: Thursday, 16-05-2024   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and2 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 for the following. (MCQ)   **10**

1) What is a miner?
    a) type of blockchain
    b) computers that validate and process blockchain transactions
    c) an algorithm that predicts the next part of the chain
    d) None of these

2) Which is NOT a part of asymmetric encryption?
    a) Public key   b) Mining
    c) Passphrase   d) Private Key

3) What is the term for when a blockchain splits?
    a) merger   b) fork
    c) sidechain   d) none of these

4) Who is introduced the digital online cryptocurrency known as Bitcoin?
    a) Satoshi Nakamoto   b) Nick Szabo
    c) Wei Dai   d) Hal Finney

5) What is the purpose of a nonce?
    a) Follows nouns
    b) A hash function
    c) Sends information to the blockchain network
    d) Prevents double spending

6) What is Proof of Stake?
    a) certificate needed to use the blockchain
    b) password needed to access an exchange
    c) how private keys are made
    d) transaction and Block Verification Protocol

7) What is a smart contract?
    a) Programs stored on a blockchain that run when predetermined conditions are met
    b) Online contract
    c) Digital contract
    d) All the above

8) If a hacker wanted to alter a blockchain, what percentage of the block copies would he have to alter?
    a) only his copy   b) 1%
    c) 51%   d) 100%

9) What is a private key?
    a) A key given to the public
    b) A key NOT to be given to the public
    c) key that opens a secret door
    d) None of these

10) What is UTXO?
    a) Unspent Transaction Output
    b) United Transaction Office
    c) Both of these
    d) None of these

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

1) Ralph Merkle invented Merkle Trees.
    a) True   b) False

2) Hash function is takes an input of any length and returns a fixed-length string of numbers and letters.
    a) True   b) False

3) A Node is computer on block chain.
    a) True   b) False

4) Cryptographic Hash function transforms arbitrary length string that act more or less as a fingerprint of the document.
    a) True   b) False

5) Immutability is characteristic makes blockchain tamper-proof.
    a) True   b) False

6) White Paper is the name of the research paper that brought Bitcoin to the world.
    a) True   b) False

Q.2   **Answer the following.**   **16**
    a) NONCE
    b) Technologies invented in Block chain 3
    c) EVM
    d) Trilemma of blockchain

Q.3   **Answer the following.**   **16**
    a) What is Byzantine Generals Problem? How Bitcoin solves the Byzantine Generals Problem?
    b) Explain Proof of work and Proof of Stake.

Q.4   **Answer the following.**   **16**
    a) Explain Hash Pointer technology used in blockchain.
    b) What is Hash functions? State Features of Hash Functions

Q.5   **Answer the following.**   **16**
    a) What is digital cash? Explain advantages and disadvantages.
    b) What are advanced technologies introduced in blockchain 2.0?

Q.6   **Answer the following.**   **16**
    a) Explain Bitcoin Scripting language and their use.
    b) Explain different security issues in Blockchain.

Q.7   **Answer the following.**   **16**
    a) State different features of sharding.
    b) What is smart contract and how it similar to real contract?