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M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE

Objects Oriented Programming Using C++ (2318101)

Day & Date: Friday, 05-01-2024
 Time: 03:00 PM To 05:30 PM

Max. Marks: 60

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 is not correct for virtual function in C++ ?
 - a) Virtual function can be static.
 - b) Virtual function should be accessed using pointers
 - c) Virtual function is defined in base class
 - d) Must be declared in public section of class
- 2) How can we make a class abstract?
 - a) By declaring it abstract using the static keyword
 - b) By declaring it abstract using the virtual keyword.
 - c) By making at least one member function as pure virtual function
 - d) By making all member functions constant
- 3) How many specifiers are present in access specifiers in class?

a) 2	b) 1
c) 4	d) 3
- 4) Which of these following members are not accessed by using direct member access operator?

a) Public	b) Private
c) Protected	d) Both b & c
- 5) Who invented C++?

a) Dennis Ritchie	b) Ken Thompson
c) Brian Kernighan	d) Bjarne Stroustrup
- 6) 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
- 7) 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>

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

B) Fill in the blank. 04

- 1) Each byte in memory is assigned a unique _____.
- 2) The _____ operator can be used to determine a variable's address.
- 3) _____ variables are designed to hold addresses.
- 4) Under older compilers, if the new operator cannot allocate the amount of memory requested, it return _____.

Q.2 Answer the following. (Any Six) 12

- a) Define reference variable. Give its syntax.
- b) What is the use of super (this) keyword in C++?
- c) Draw a neat and clean diagram to show exception handling model in C++.
- d) What are the file streams?
- e) Why the use of goto statement is not good for quality programming?
- f) Differentiate between keyword and identifier.
- g) What do you mean by a token?
- h) Define Encapsulation and Data hiding.

Q.3 Answer the following. (Any Three) 12

- a) Differentiate between pass by value and pass by reference. Also explain the pass by address in C++.
- b) Write down the example of dynamic constructor in C++.
- c) How overriding is different from the overloading.
- d) What is role of manipulators in C++. Write down different manipulators in C++.

Q.4 Answer the following. (Any Two) 12

- a) Demonstrate hybrid inheritance with the help of suitable example.
- b) Write a program to add two complex numbers using object as arguments.
- c) What is constructor? Explain constructor overloading with example.

Q.5 Answer the following. (Any Two) 12

- a) Write down the program to demonstrate static keyword in C++.
- b) Differentiate between do.. while and while loops on the basis of syntax.
- c) Demonstrate user defined exception with suitable example.

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**M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE**

Data Structures and Algorithms (2318107)

Day & Date: Tuesday, 09-01-2024
Time: 03:00 PM To 05:30 PM

Max. Marks: 60

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

Q.1 A) Choose correct alternatives

08

- 1) Each _____ is built up from the basic data types of the underlying programming language using the available data structuring facilities.
 - a) Data Structure
 - b) Data type
 - c) Intrinsic data type
 - d) Derived data type
- 2) A list is easily traversed and new elements can be appended readily to the _____ of the list.
 - a) Head
 - b) Tail
 - c) Header
 - d) Footer
- 3) Array index always starts with _____.
 - a) Non-Zero
 - b) Zero
 - c) One
 - d) Negative
- 4) In _____ last object added to the collection will be the first object returned.
 - a) Array
 - b) Linked Last
 - c) Queue
 - d) Stack
- 5) _____ is like a line at a store checkout counter, people enter the line and are serviced in the order they arrive.
 - a) Graph
 - b) Tree
 - c) Stack
 - d) Queue
- 6) In _____, each node can have 0, 1 or 2 children.
 - a) DFS
 - b) Binary Tree
 - c) BFS
 - d) Linear Tree
- 7) The bottleneck is usually the movement of data between main and _____ storage, and we must move data in large blocks to be efficient.
 - a) Primary
 - b) Secondary
 - c) Internal
 - d) External
- 8) _____ sort works by making a single pass through the array and inserting the current value into the already sorted (beginning) portion of the array.
 - a) Selection
 - b) Insertion
 - c) Merge
 - d) Quick

B) Write True or False. 04

- 1) Selection Sort is another divide and conquer sorting algorithm.
- 2) Integer (int) 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 Front only.
- 4) Arithmetic expression can be evaluated using Linked List.

Q.2 Answer the following. (Any Six) 12

- a) What is Matrix-Array?
- b) What is Non-Linear Data Structure?
- c) What do you mean by LIFO?
- d) Define Homogenous Data.
- e) How to implement Depth First Search?
- f) What do you mean by Internal Sorting?
- g) What is Priority Queue?
- h) What is Linked List?

Q.3 Answer the following. (Any Three) 12

- a) State and explain in brief Stack Overflow and Underflow conditions.
- b) What is mean by Queue? Explain Circular Queue with suitable example.
- c) Explain in brief Doubly Linked List with example.
- d) What do you mean by Binary tree? How Binary tree is different from Tree?

Q.4 Answer the following. (Any Two) 12

- a) Perform Radix Sort on given series below
Series - 9469, 8811, 4652, 1237, 8654, 1643, 9173, 2876, 1056, 9785, 6975
- b) Discuss solution for Tower of Hanoi Problem with four disks and three pegs.
- c) Discuss in detail Two Dimensional Array to do matrix multiplication with suitable example.

Q.5 Answer the following. (Any Two) 12

- a) Generate Binary Search Tree of given series and state the pre-order, in-order and post-order traversing results of it.
Series- 25, 20, 36, 10, 22, 30, 40, 5, 12, 28, 38, 48
- b) Explain in detail various operations on Singly Linked List to insert or delete an item from it.
- c) Perform Merge Sort and result the sorted list of the below given series-
Series- 164, 3647, 987, 465, 7894, 1234, 852, 147, 9631, 8426, 9137, 4628

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M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Operating System (2318108)

Day & Date: Tuesday, 09-01-2024

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.

08

- 1) What is an operating system?
 - a) Interface between the hardware and application programs
 - b) Collection of programs that manages hardware resources
 - c) System service provider to the application programs
 - d) All of the mentioned
- 2) CPU scheduling is the basis of _____.
 - a) Multiprogramming operating systems
 - b) Larger memory sized systems
 - c) Multiprocessor systems
 - d) None of the above
- 3) When a process is in a "Blocked" state waiting for some I/O service. When the service is completed, it goes to the _____.
 - a) Terminated state
 - b) Suspended state
 - c) Running state
 - d) Ready state
- 4) The FCFS algorithm is particularly troublesome for _____.
 - a) Operating systems
 - b) Multiprocessor systems
 - c) Time sharing systems
 - d) Multiprogramming systems
- 5) Which one of the following is the deadlock avoidance algorithm?
 - a) Banker's algorithm
 - b) Round-robin algorithm
 - c) Elevator algorithm
 - d) Kam's algorithm
- 6) What is Linux?
 - a) Single user, single tasking
 - b) Single user, multitasking
 - c) Multi user, single tasking
 - d) Multi user, multitasking
- 7) What is the mounting of file system?
 - a) Creating of a filesystem
 - b) Deleting a filesystem
 - c) Attaching portion of the file system into a directory structure
 - d) Removing the portion of the file system into a directory structure

- 8) The state of a process is defined by _____.
a) The final activity of the process
b) The activity just executed by the process
c) The activity to next be executed by the process
d) The current activity of the process

B) State True or False.**04**

- 1) Deadlock can never occur if no process is allowed to hold a resource while requesting another resource.
- 2) Round robin scheduling provides a latency improvement over FCFS scheduling for interactive jobs.
- 3) In OS memory management, page sizes are always power of 3.
- 4) Using mutual exclusion ensures that a system avoids deadlock.

Q.2 Write Short Note on. (Any Six)**12**

- a) Define thread and list its types.
- b) What is Linux loader?
- c) What is process? List out operations on process.
- d) What is multiprocessing operating system?
- e) What is critical section?
- f) Define semaphore and synchronization.
- g) Define term system calls.
- h) What is the meaning of mutual exclusion?

Q.3 Answer the following. (Any Three)**12**

- a) Discuss different directory structure of file system organization.
- b) How processes in system used to do inter process communication?
- c) Explain services provided by operating system.
- d) Explain segmentation in detail.

Q.4 Answer the Following. (Any Two)**12**

- a) What is operating system? Explain the types of operating system.
- b) What is deadlock? Explain deadlock avoidance technique with example.
- c) Explain FCFS and Round Robin algorithm in detail.

Q.5 Answer the following. (Any Two)**12**

- a) What is page replacement algorithm? Explain any one page replacement algorithm in detail.
- b) Discuss different types of schedulers and their task in CPU Scheduling.
- c) Discuss in detail different types of allocation methods as a part of file system implementation.

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**M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE**

Research Methodology in Computer Science (2318103)

Day & Date: Thursday, 11-01-2024
Time: 03:00 PM To 05:30 PM

Max. Marks: 60

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

Q.1 A) Choose correct alternative.

08

- 1) Basic research is also known as _____ Research.
 - a) Applied
 - b) Fundamental
 - c) Descriptive
 - d) Analytical
- 2) Research is related with: _____
 - a) Discovery of new idea
 - b) To find the Solution
 - c) Investigation of Problem
 - d) All of the above
- 3) The major purpose of _____ research is description of the state of affairs as it exists at present.
 - a) applied
 - b) descriptive
 - c) analytical
 - d) fundamental
- 4) _____ research is based on the measurement of quantity.
 - a) Applied
 - b) Descriptive
 - c) Quantitative
 - d) Fundamental
- 5) _____ research aims at finding a solution for an immediate problem facing a society or an industrial /business organization.
 - a) Quantitative
 - b) Qualitative
 - c) Descriptive
 - d) Applied
- 6) A _____ is defined as a publication issued in successive part, usually at regular intervals, and as a rule, intended to be continued indefinitely.
 - a) conference
 - b) periodical
 - c) Research Paper
 - d) Book
- 7) There are _____ basic elements of a literature review.
 - a) 2
 - b) 3
 - c) 4
 - d) 5
- 8) The method that consists of collection of data through observation and experimentation, formulation and testing of hypothesis is called _____ method.
 - a) Empirical
 - b) Scientific
 - c) Scientific information
 - d) Practical knowledge

B) State true/false.**04**

- 1) The major purpose of Descriptive research is description of the state of affairs as it exists at present.
- 2) Quantitative research is specially important in the behavioural sciences.
- 3) Research design constitutes the blueprint for the collection, measurement and analysis of data.
- 4) A periodical is defined as a publication issued in successive part, usually at regular intervals, and as a rule, intended to be continued indefinitely.

Q.2 Answer the following. (Any Six)**12**

- a) Define the Research.
- b) What do you mean by Encyclopedia?
- c) What are indices?
- d) What is Literature Review?
- e) What is International Journal?
- f) How the existing text can be converted into multiple columns?
- g) What is mean by Hypothesis?
- h) How many sections of research format are? State it.

Q.3 Answer the following. (Any Three)**12**

- a) Explain in short Report structure.
- b) State and explain major contents of research Synopsis.
- c) Explain objectives of Research.
- d) What is digital Lab? Explain its importance in research.

Q.4 Answer the following. (Any Two)**12**

- a) Explain Motivations in research.
- b) Explain Applied vs. Fundamental 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 Good Research Design.
- b) What is Research Problem? Explain different components of research problem.
- c) What is Abstract? Explain the purpose of Abstract in research report.

- 8) Which of the following statements is correct about the formal parameters in C++?
 - a) Parameters with which functions are called
 - b) Parameters which are used in the definition of the function
 - c) Variables other than passed parameters in a function
 - d) Variables that are never used in the function
- 9) What is virtual inheritance in C++
 - a) C++ technique to enhance multiple inheritance
 - b) C++ technique to ensure that a private member of the base class can be accessed somehow
 - c) C++ technique to avoid multiple inheritances of classes
 - d) C++ technique to avoid multiple copies of the base class into children/derived class
- 10) What happens if the following C++ statement is compiled and executed? `int *ptr = NULL; delete ptr;`
 - a) The program is not semantically correct
 - b) The program is compiled and executed successfully
 - c) The program gives a compile-time error
 - d) The program compiled successfully but throws an error during run-time

B) Write true/false.

06

- 1) Sub classes may also be called Child classes/Derived classes.
 - a) True
 - b) False
- 2) An identifier must start with a letter or an underscore.
 - a) True
 - b) False
- 3) There is no limit on the size of the numbers that can be stored in the int data type
 - a) True
 - b) False
- 4) All data types take up the same amount of storage
 - a) True
 - b) False
- 5) It is not possible to achieve inheritance of structures in C++?
 - a) True
 - b) False
- 6) Super classes are also called Parent classes/Base classes.
 - a) True
 - b) False

Q.2 Answer the following.

16

- a) List out the features of OOPS? Explain Polymorphism and encapsulation.
- b) Why comments, symbolic statements and special operators are used in C++ programming?
- c) What is array of structure?
- d) Differentiate between structure and union

Q.3 Answer the following.

16

- a) How can you mean by exception whenever the input number is less than zero.
- b) What do you mean by operator precedence?

Q.4 Answer the following.

16

- a) What are the features of Object oriented programming.
- b) Explain use of friend function with the help of suitable example.

- Q.5 Answer the following.** **16**
- a) Explain bitwise operators with example.
 - b) What is an array? Explain types of arrays with example. What are the advantages and disadvantages of using array?
- Q.6 Answer the following.** **16**
- a) State any four points of differentiation between compile time polymorphism and run time polymorphism.
 - b) Differentiate between do ..while and while loops on the basis of syntax.
- Q.7 Answer the following.** **16**
- a) Write a C++ program to overload area() function to calculate area of shapes like triangle, square, circle.
 - b) Write a C++ program to calculate root of quadratic equations by initializing the object using default constructor.

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M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Advanced DBMS (MSC18102)

Day & Date: Sunday, 07-01-2024
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- 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) _____ Matches row those have matching values in different columns of the same table.
 - a) Self-Join
 - b) Equi-Join
 - c) Cartesians-Join
 - d) Outer-Join
- 2) In SQL _____ operator is used to compare multiple value.
 - a) BETWEEN
 - b) IN
 - c) GROUP
 - d) LIKE
- 3) Which of the following creates a virtual relation for storing the query?
 - a) Function
 - b) View
 - c) Procedure
 - d) None of the mentioned
- 4) A _____ consists of a sequence of query and/or update statements.
 - a) Transaction
 - b) Commit
 - c) Rollback
 - d) Flashback
- 5) Data integrity constraints are used to:
 - a) Control who is allowed access to the data
 - b) Ensure that duplicate records are not entered into the table
 - c) Improve the quality of data entered for a specific property (i.e., table column)
 - d) Prevent users from changing the values stored in the table
- 6) To include integrity constraint in an existing relation use:
 - a) Create table
 - b) Modify table
 - c) Drop table
 - d) Alter table
- 7) Domain constraints, functional dependency and referential integrity are special forms of _____.
 - a) Foreign key
 - b) Primary key
 - c) Assertion
 - d) Referential constraint

SLR-EG-7

- 8) Which of the following closely resembles Create view?
 - a) Create table ...like
 - b) Create table ... as
 - c) With data
 - d) Create view as
- 9) Tables in second normal form (2NF):
 - a) Eliminate all hidden dependencies
 - b) Eliminate the possibility of a insertion anomalies
 - c) Have a composite key
 - d) Have all non key fields depend on the whole primary key
- 10) A stored procedure in SQL is a _____.
 - a) Block of functions
 - b) Group of Transact-SQL statements compiled into a single execution plan
 - c) Group of distinct SQL statements
 - d) None of the mentioned

B) Write true/false.

06

- 1) Atomicity ensures that all operations within the work unit are completed successfully.
- 2) Isolation ensures that the database properly changes states upon a successfully committed transaction.
- 3) The relational database model was created by E.F. Codd.
- 4) Applications are programs that interact directly with the database.
- 5) The XML family of standards is very important in database processing.
- 6) A database has a built-in capability to create, process and administer itself.

Q.2 Answer the following.

16

- a) Explain the architecture of DBMS.
- b) Explain the different data types in SQL.
- c) Explain the role of a data base administrator.
- d) What is schedule? Explain it.

Q.3 Answer the following.

- a) What is Entity? And also define Relationship. List and explain the symbols used to draw ER Diagram. 08
- b) How does DBMS provide data abstraction? Explain the concept of data independence. 08

Q.4 Answer the following.

- a) Explain in detail about Database Management System advantages over file management system. 08
- b) What is Join in SQL? Explain different types of joins in SQL. 08

SLR-EG-7

Q.5 Answer the following.

- a) Distinguish between centralized and distributed architectures of a database system. **08**
- b) By considering suitable examples, describe the usage of SQL CREATE and ALTER statements. **08**

Q.6 Answer the following.

- a) Mention various groups of database users. Explain about their roles in detail. **08**
- b) What is database Recovery? Explain log based Recovery in detail. **08**

Q.7 Answer the following.

- a) What is transaction? Explain ACID properties of transactions. **08**
- b) What is a Cursor? How to create it? Explain types of Cursor. **08**

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M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Data Structures and Algorithms (MSC18103)

Day & Date: Tuesday, 09-01-2024
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

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

Q.1 A) Choose correct alternatives.

10

- 1) The data structure required to check whether an expression contains a balanced parenthesis is?
 - a) Stack
 - b) Queue
 - c) Array
 - d) Tree
- 2) A queue is a _____.
 - a) FIFO (First In First Out) list
 - b) LIFO (Last In First Out) list
 - c) Ordered array
 - d) linear tree
- 3) The total number of fields in nodes of singly linked list is _____.
 - a) One
 - b) Two
 - c) Three
 - d) Four
- 4) Partition and exchange sort is _____.
 - a) Bubble sort
 - b) Quick sort
 - c) Heap sort
 - d) tree sort
- 5) Array can be considered as set of elements stored in consecutive memory locations but having _____.
 - a) Same data type
 - b) Different data type
 - c) Same scope
 - d) none of these
- 6) Which of the following searching algorithm is fastest?
 - a) binary search
 - b) linear search
 - c) jump search
 - d) all are equally fast
- 7) What is the other name for a shell sort algorithm?
 - a) Diminishing increment sort
 - b) Diminishing decrement sort
 - c) Insertion sort
 - d) Selection sort
- 8) Stack is used for _____.
 - a) Recursion
 - b) Inter conversion between expression
 - c) Matching parenthesis
 - d) All of these
- 9) The first node of linked list is called _____.
 - a) Head
 - b) Tail
 - c) List
 - d) None of these
- 10) Heap can be used as _____.
 - a) Priority queue
 - b) Stack
 - c) A decreasing order array
 - d) Normal Array

- B) Write True or False.** **06**
- 1) Stack works in FIFO.
 - 2) Tree is linear data structure.
 - 3) A graph is collection of vertices and edges.
 - 4) The time complexity of binary search is $O(\log_2 n)$.
 - 5) The balance factor of AVL tree is 0, 1, and 2.
 - 6) An undirected graph which contains no cycles is called a forest.
- Q.2 Answer the following** **16**
- a) Difference between Linear search and binary search.
 - b) What is DFS? Explain with example.
 - c) What is priority queue?
 - d) What is an Array? Explain with suitable example.
- Q.3 Answer the following.**
- a) Write a program for implementation of queue. **08**
 - b) Explain tree traversal algorithm with example. **08**
- Q.4 Answer the following.**
- a) What is binary search tree? Explain with example. **08**
 - b) Explain insertion sort algorithm with example. **08**
- Q.5 Answer the following.**
- a) Write a program for binary search method. **08**
 - b) What is linked list? Explain types of linked list. **08**
- Q.6 Answer the following.**
- a) What is graph? Explain linked representation of graph. **08**
 - b) Write a program for bubble sort method. **08**
- Q.7 Answer the following.**
- a) Write an algorithm for converting infix expression to postfix expression. **08**
 - b) Write an algorithm for inserting and deleting an element from doubly linked list. **08**

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M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Software Engineering (MSC18109)

Day & Date: Thursday, 11-01-2024

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) The major drawback of RAD model is _____.
 - a) It requires highly skilled developers/designers
 - b) It necessitates customer feedbacks
 - c) It increases the component reusability
 - d) Both (a) & (b)
- 2) _____ is the incorrect testing technique.
 - a) Collaboration testing b) Integration testing
 - c) System testing d) Unit testing
- 3) 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
- 4) Software failure would occur due to _____.
 - a) Software delivered behind schedule
 - b) Software exceeding cost estimate
 - c) Difficult to maintain
 - d) All of the above
- 5) A collection of computer programs, procedures, rules and associated documentation and data is called _____.
 - a) Product b) Process
 - c) Software d) Prototype
- 6) The context diagram is also known as _____.
 - a) Level-0 DFD b) Level-1 DFD
 - c) Level-2 DFD d) All of the mentioned
- 7) _____ tool are used for project planning, cost effort estimation, project scheduling and resource planning.
 - a) Process modeling tool b) Project management tool
 - c) Diagram tool d) Documentation tool

- 8) Boundary value analysis belong to _____.
- White Box Testing
 - Black Box Testing
 - White Box & Black Box Testing
 - None of the mentioned
- 9) CASE stands for _____.
- Computer Aided Software Engineering
 - Cost Aided Software Engineering
 - Control Aided Software Engineering
 - None of the mentioned
- 10) In UML, _____ are the entities that interact with the system.
- Use Cases
 - Actors
 - Classes
 - Component

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

- Software engineering umbrella activities are only applied during the initial phases of software development projects.
- A good software development team always uses the same task set for every project to insure high quality work products.
- The design model should be traceable to the requirements model?
- In agile development it is more important to build software that meets the customers' needs today than worry about features that might be needed in the future.
- Architecture design describes how the software communicates within itself, with systems that interoperate with it, and with humans who use it.
- Test derived from behavioral class models should be based on the State transition diagram.

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

- Software Quality Assurance
- Data Dictionary
- Information hiding
- Acceptance Testing

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

- What is Software Measurement? Explain size oriented and function oriented metrics in detail?
- Explain requirement analysis and analysis principles in detail?

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

- Explain Incremental Process model in detail?
- Explain DFD and ERD with one example each?

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

- What is Interface design? Explain in detail?
- Explain transform and transaction mapping in detail?

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

- Explain basic path testing in detail?
- Explain object oriented design process in detail?

Q.7 Answer the following.

- a) What is Software? Explain different characteristics of Software?
- b) Explain the difference between Black-Box testing and White-Box testing?

- 9) Which of the following is false?
- a) A note is a dog-eared box connected to any model element by a dashed line
 - b) The main way to extend UML is by constraints, properties, etc
 - c) A dependency relation holds between two entities D and I where change in I does not affect D
 - d) All of the mentioned
- 10) A package diagram consists of the following?
- a) Package symbols
 - b) Groupings of Use cases, classes, components
 - c) Interface
 - d) a, b

B) Write True/False**06**

- 1) Attributes are the data that represents characteristics of interest about an object.
- 2) An object class is a set of object instances that share the same attributes and behavior.
- 3) Behavior is the packaging of several items together into one unit.
- 4) Class diagrams model how events can change the state of an object class over its lifetime.
- 5) An activity diagram can be used to model logic with the system.
- 6) An abstract use case represents a form of “reuse”.

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

- a) What is structural model?
- b) What is transition?
- c) What is relationship?
- d) What is Package?

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

- a) Explain in Details Conceptual Modeling.
- b) Explain about the architecture of the UML.

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

- a) What is an attribute? Explain its syntax in UML with Example.
- b) Draw the class diagram for the School Management System.

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

- a) Explain various phases of Software development Life cycle.
- b) Explain Interaction Diagram with example.

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

- a) Explain sequence diagrams with Example.
- b) Explain Mechanisms in UML and architecture in UML.

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

- a) Write about deployment diagrams. How to model a fully distributed system?
- b) What is a package? Explain importing and exporting in packages.

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M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Java Programming (MSC18201)

Day & Date: Monday, 18-12-2023
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- 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) Java programs are _____.
 - a) Faster than others
 - b) Platform independent
 - c) Not reusable
 - d) Not scalable
- 2) _____ is passed to a method by use of call by reference.
 - a) Variables
 - b) Objects
 - c) Methods
 - d) Operators
- 3) The command javac is used to _____.
 - a) debug a java program
 - b) compile a java program
 - c) interpret a java program
 - d) execute a java program
- 4) Which of the following do not represent legal flow control statements?
 - a) break;
 - b) return;
 - c) exit();
 - d) continue outer;
- 5) Using which keyword we can access the value of the instance variables and class variables of that class inside the method of that class itself?
 - a) super
 - b) final
 - c) this
 - d) either super or this
- 6) Variable declared as _____ do not occupy on a per-instance basis.
 - a) static
 - b) final
 - c) abstract
 - d) code
- 7) The new operator dynamically allocates _____ for an object and returns a reference to it.
 - a) classes
 - b) variables
 - c) memory
 - d) none of the above
- 8) Inner classes are _____.
 - a) anonymous classes
 - b) nested classes
 - c) subclasses
 - d) derived classes
- 9) Native-protocol pure Java converts _____ into the _____ used by DBMSs directly.
 - a) JDBC calls, network protocol
 - b) ODBC class, network protocol
 - c) ODBC class, user call
 - d) JDBC calls, user call

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M.Sc. (Semester - II) (New) (CBCS) Examination Oct/Nov-2023
COMPUTER SCIENCE
Python Programming (MSC18202)

Day & Date: Tuesday, 19-12-2023
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

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

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

- 1) _____ of the following is/are types of file.
 - a) Text file
 - b) Binary file
 - c) Both a) and b)
 - d) None of these
- 2) Which of the following type of mode is used to open a file in exclusive mode?
 - a) a
 - b) r
 - c) rb
 - d) x
- 3) Variables that are defined inside a function body have a _____.
 - a) local scope
 - b) global scope
 - c) Both a) and b)
 - d) none of these
- 4) Which of the following is the correct way of writing range type _____.
 - a) range(10)
 - b) range(1,10)
 - c) range(1,10,2)
 - d) All of these
- 5) _____ represents memory block where names are mapped to objects.
 - a) namespace
 - b) Array
 - c) Object
 - d) class
- 6) _____ of the following is the correct syntax for defining constructor.
 - a) def __init__(self, parameters):
 - b) def __init(self, parameters):
 - c) def __init__(parameters):
 - d) definit(self, parameters):
- 7) _____ is a built-in method useful to call the super class constructor or methods.
 - a) static()
 - b) super()
 - c) call_super()
 - d) call()
- 8) Which method is used to draw a line in canvas tkinter?
 - a) line()
 - b) canvas.create_line()
 - c) create_line(canvas)
 - d) None of the above
- 9) To change the property of the widget after the declaration of widget, what we use?
 - a) mainloop() function
 - b) pack() function
 - c) config() function
 - d) title() function

- 10) To open or connect with the database, which function we used or call at runtime?
- a) open()
 - b) connect()
 - c) database()
 - d) All of the above

B) Fill in the blanks. 06

- 1) To install matplotlib _____ command is used.
- 2) Django is _____ python web framework.
- 3) The code statement `math.ceil(2.5)` return _____
- 4) _____ method is used to detect the status of a python thread.
- 5) _____ widget allow to select multiple items.
- 6) The output of, `print(len([1, 2, "ABC"]))` is_____.

Q.2 Answer the following. 16

- a) Explain the difference between list and tuple.
- b) Explain keyword argument and variable length arguments in function.
- c) Explain anonymous (lambda) function with example.
- d) Define module. Explain how to create and import module.

Q.3 Answer the following. 08

- a) Explain different GUI widgets like Frame, Label, Entry, Checkbutton, Radiobutton, Spinbox and Button widgets. 08
- b) Write a python application to insert Student details like roll_no, name, address and marks and update the marks of student having roll_no 505, display entire result using MySQL database. 08

Q.4 Answer the following. 08

- a) What is inheritance? Explain multilevel inheritance with suitable example. 08
- b) What is Generator? Write a program to demonstrate the use of generator. 08

Q.5 Answer the following. 10

- a) What is DataFrame? Explain how to create a DataFrame from python list. 10
- b) Explain the creating a Thread by creating a Sub Class to Thread Class. 06

Q.6 Answer the following. 10

- a) What is Data Visualization? Create a Pie Chart to visualize the data of Students as Course_name and No. of Students Enrolled. 10
- b) What is numpy module? Explain different operations on numpy array. 06

Q.7 Answer the following. 10

- a) Create a pandas DataFrame and show the functionalities of Selection of row, Addition of row and Deletion of row. 10
- b) Explain Djangotemplates. 06

Seat
No.

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE

Computer Communication Network (MSC18207)

Day & Date: Wednesday, 20-12-2023
Time: 11:00 AM To 02:00 PM

Max. Marks: 80

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

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

- 1) SMTP uses ____ TCP port.
 - a) 25
 - b) 20
 - c) 22
 - d) 21
- 2) In ____ in which every incoming packet is sent out on every outgoing line except the one it arrived on.
 - a) hierarchical routing
 - b) flooding
 - c) optimality principle
 - d) shortest routing
- 3) The arrangement where all data pass through a central computer is known as _____.
 - a) Mesh topology
 - b) Star topology
 - c) Ring topology
 - d) Bus topology
- 4) Parity bits are used _____.
 - a) To detect error
 - b) To identify user
 - c) To encrypt data
 - d) None of these
- 5) In _____, packet sends simultaneously to all destinations.
 - a) Congestion
 - b) Spanning
 - c) Broadcasting
 - d) None of these
- 6) In _____ protocol, client contacts server using transmission control protocol as the transport protocol.
 - a) SMTP
 - b) HTTP
 - c) IP
 - d) FTP
- 7) ICMP stands for _____.
 - a) Internet Control Message Particle
 - b) Internet Control Message Protocol
 - c) Internet Control Message Point
 - d) None of the above
- 8) _____ is the network device used to connect two dis-similar types of networks.
 - a) Gateway
 - b) Hub
 - c) Bridge
 - d) Switch
- 9) In OSI model, _____ layer provides dialog control and token management.
 - a) network
 - b) data link
 - c) session
 - d) transport

- 10) _____ is the first network based on TCP/IP protocol.
- a) ARPANET
 - b) Router
 - c) HUB
 - d) Ethernet card

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

- 1) TCP protocol reports on the success or failure of the data delivery.
- 2) Protocols in which the sender sends one frame and then waits for an acknowledgement before proceeding are called stop and wait.
- 3) WWW is the collection of the hyperlinked document on the internet.
- 4) Physical layer is concerned with transmitting raw bits over a communication channel.
- 5) Transport layer provides dialog control and token management.
- 6) HTTP is a markup language.

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

- a) LAN
- b) WAP-The Wireless Application Protocol
- c) Congestion
- d) WWW

Q.3 Answer the following:

- a) What is IP? Explain IP header structure in detail? **08**
- b) Explain ICMP (Internet Control Message Protocol) in detail? **08**

Q.4 Answer the following:

- a) Explain different applications of computer network? **08**
- b) What is Routing? Explain any two Routing algorithms in detail. **08**

Q.5 Answer the following:

- a) Explain OSI Reference Model? **08**
- b) Explain Client-Server model in detail? **08**

Q.6 Answer the following:

- a) Explain Transmission Control Protocol (TCP) in detail? **08**
- b) Explain Tunneling mechanism in detail? **08**

Q.7 Answer the following

- a) Explain DNS in detail? **08**
- b) Explain Berkeley socket in detail? **08**

Seat No.	
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M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Artificial Intelligence (MSC18208)

Day & Date: Wednesday, 20-12-2023
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

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

Q.1 A) Choose the correct alternative.

10

- 1) A heuristic is a way of trying _____.
 - a) To discover something or an idea embedded in a program
 - b) To search and measure how far a node in a search tree seems to be from a goal
 - c) To compare two nodes in a search tree to see if one is better than the other is
 - d) All of the above
- 2) A production rule consists of _____.
 - a) A set of Rule
 - b) A sequence of steps
 - c) Both (a) and (b)
 - d) Arbitrary representation of a problem
- 3) DARPA, the agency that has funded a great deal of American Artificial Intelligence research, is part of the Department of _____.
 - a) Defense
 - b) Energy
 - c) Education
 - d) Justice
- 4) Fuzzy relation is a fuzzy set defined on the Cartesian product of _____.
 - a) single set
 - b) crisp set
 - c) union set
 - d) intersection set
- 5) Genetic algorithm _____ uses to determine optimization.
 - a) fit function
 - b) fitness function
 - c) strength function
 - d) none of the above
- 6) In language understanding, the levels of knowledge that do not include?
 - a) Phonological
 - b) Syntactic
 - c) Empirical
 - d) Logical
- 7) Neural network can learn various tasks from _____.
 - a) training
 - b) testing
 - c) learning
 - d) none of the above
- 8) Graph used to represent semantic network is _____.
 - a) Undirected graph
 - b) Directed graph
 - c) Directed Acyclic Graph (DAG)
 - d) Directed complete graph
- 9) The performance of an agent can be improved by _____.
 - a) Learning
 - b) Observing
 - c) Perceiving
 - d) None of the above

- 10) In which of the following situations might a blind search be acceptable?
- a) real-life situation
 - b) complex game
 - c) small search space
 - d) all of the above

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

- 1) A knowledge-based agent can combine general knowledge with current percepts to infer hidden aspects of the current state before selecting actions.
 - a) True
 - b) False
- 2) Neural network is also known as _____.
- 3) _____ mimic the principle of natural genetics.
- 4) _____ is the well-known Expert System for medical diagnosis systems.
- 5) The reproduction operator is also known as selection.
 - a) True
 - b) False
- 6) Fuzzy relation associates columns to a varying degree of membership.
 - a) True
 - b) False

Q.2 Answer the Following. 16

- a) List out the advantages of production systems.
- b) What is the difference between procedural and declarative knowledge?
- c) Explain Expert System Shells.
- d) Explain Depth First Search with an example.

Q.3 Answer the following: 16

- a) Explain the Bayes Theorem with a suitable example.
- b) What are the approaches to knowledge representation? Explain in detail.

Q.4 Answer the following: 16

- a) Explain the genetic algorithm in detail.
- b) Explain the Minimax search procedure.

Q.5 Answer the following: 16

- a) Explain AI techniques in detail.
- b) What are the different types of agents? Explain in detail.

Q.6 Answer the following: 16

- a) Define Expert System. Explain in detail the process of knowledge acquisition.
- b) What is matching? Explain matching with an example.

Q.7 Answer the following 16

- a) State and explain the water jug problem with a suitable example.
- b) Define Game playing. Explain in minimax search procedure with a suitable example.

B) Fill in the blanks. 06

- 1) If the pixel value is '0' then it represents in _____ color.
- 2) The full form of CAT in image processing is _____.
- 3) Consider four vectors as $x_1 = (1,0,1)^T, x_2 = (1,1,1)^T, x_3 = (1,0,0)^T$ and $x_4 = (0,1,1)^T$ then the value of mean vector is _____.
- 4) _____ is maximum possible intensity of 5 bit image
- 5) The _____ transformation maps a narrow range of low gray-level values in the input image into a wider range of the output levels. (Log)
- 6) DPI stands for _____.

Q.2 Answer the following. 16

- a) Write note on Histogram Stretching.
- b) Explain Eccentricity and circularity in detail.
- c) What is negative transformation? Find negative transformation of following 6 bit image
 $I = (60,26,28,36,10,15,22,54,48)$
 Find its negative image.
- d) Explain three levels of image processing?

Q.3 Answer the following.

- a) Explain Morphological Watersheds and dam construction in detail. 08
- b) Explain image enhancement using Fourier transformation. 08

Q.4 Answer the following.

- a) Explain pattern and pattern class in detail. 06
- b) Threshold following image using global thresholding algorithm. 10

19	122	165	138	211
187	195	133	199	89
114	142	93	178	209
134	149	163	190	210
60	169	188	205	177

Select initial threshold as 115 and stop algorithm when difference of threshold is less than 0.1.

Q.5 Answer the following.

- a) Explain any 4 noise available in image. 08
- b) What are different types of segmentation? Explain region base segmentation. 08

Q.6 Answer the following.

- a) Explain bit plane slicing in detail. 08
- b) Explain Restoration Process in detail. 08

Q.7 Answer the following.

- a) What are applications of Digital Image Processing based on electromagnetic spectrum? 08
- b) What is Adjacency and connectivity? Explain different types of Adjacency and connectivity in detail. 08

Set No.	
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**M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE**

Open Source Technologies (PHP, MySql) (MSC18302)

Day & Date: Sunday, 07-01-2024
Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- 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) By using _____ keyword we prevent a method from being overridden by a subclass.
 - a) Final
 - b) Static
 - c) Sealed
 - d) Abstract
- 2) The _____ function is used to adds a value at the end of an array.
 - a) into_array()
 - b) inend_array()
 - c) array_unshift()
 - d) array_push()
- 3) The _____ methods is used to manage result sets using associative arrays.
 - a) get_array()
 - b) get_associative_array()
 - c) mysqli_fetch_array()
 - d) mysqli_fetch_row()
- 4) The _____ type of class doesn't have object.
 - a) inherited class
 - b) abstract class
 - c) constant class
 - d) base class
- 5) The _____ lines need to be uncommented or added in the php.ini file so as to enable mysqli extension.
 - a) extension=php_mysqli.dll
 - b) extension=mysqli.dll
 - c) extension=mysqli.dll
 - d) extension=mysqli.dll
- 6) The _____ method is used to converts the first character of each word in a string to uppercase.
 - a) wordupper()
 - b) upper()
 - c) uppercase()
 - d) ucwords()
- 7) The _____ method returns the most recently generated error message.
 - a) errno()
 - b) errdes()
 - c) error()
 - d) errmsg()
- 8) The _____ method returns an associative array containing the names of all properties and their corresponding values defined within the class specified by class_name.
 - a) get_class_vars()
 - b) class_vars()
 - c) get_vars()
 - d) class_prop_vars()
- 9) The _____ operator is used for concatenation in PHP.
 - a) + (plus)
 - b) * (Asterisk)
 - c) . (dot)
 - d) & (ampersand)

- 10) The _____ PHP statement will give output as \$x on the screen.
- a) echo "\\$x";
 - b) echo "\$\$x";
 - c) echo"/\$x";
 - d) echo "\$x";

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

- 1) In PHP, constructor is created using _____ method.
- 2) The properties or methods that are not invoked by any particular object but shared by all class instances are created using _____ keyword.
- 3) In mysqli, the database name is select using _____ method.
- 4) The reference parameter are passed to function using _____.
- 5) The _____ method is used to sort an associative array in ascending order.
- 6) Every variable in PHP will start with _____ symbol.

Q.2 Answer the following.

- a) What are advantages of Joomla? **04**
- b) Explain different type casting functions in PHP. **04**
- c) Explain any 8 string functions used in PHP. **04**
- d) Write PHP script to upload word file. **04**

Q.3 Answer the following.

- a) What is inheritance and its types? Explain any two types with example. **08**
- b) What is session and cookies? Explain how to read and write cookies with example. **08**

Q.4 Answer the following.

- a) What are different ways to create arrays? Write script to read and display multidimensional array. **08**
- b) What is difference between Errors and Exceptions? Explain any 5 built in exceptions with example. **08**

Q.5 Answer the following.

- a) Write PHP script to select and insert records using stored procedure. **10**
- b) What are different steps to create MySQL API Database Applications? **06**

Q.6 Answer the following.

- a) What are advantages and disadvantages of PHP? **10**
- b) Write PHP script for: **06**
 - 1) Displaying prime number up to n.
 - 2) Display Fibonacci series up to n.

Q.7 Answer the following.

- a) What are different datatypes used in MySQL? Explain different data type attributes used in PHP with example. **08**
- b) Explain any 8 PHP functions used with MySQL connections with example. **08**

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M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Network Security (MSC18307)

Day & Date: Tuesday, 09-01-2024
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- 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) _____ ensures the integrity and security of data that are passing over a network.
 - a) Firewall
 - b) Antivirus
 - c) Pentesting tools
 - d) Network-security protocols
- 2) _____ provides privacy, integrity, and authentication in e-mail.
 - a) IPSec
 - b) SSL
 - c) PGP
 - d) None of the Above
- 3) _____ is the first step in DES.
 - a) Key transformation
 - b) Expansion permutation
 - c) S-box substitution
 - d) P-box substitution
- 4) A substitution cipher substitutes one symbol with _____.
 - a) Keys
 - b) Multi Parties
 - c) Single Party
 - d) None of These
- 5) Which of the following is used for encrypting data at the network level?
 - a) HTTPS
 - b) SMTP
 - c) S/MIME
 - d) IPSec
- 6) Biometric authentication works on the basis of _____.
 - a) Human characteristics
 - b) Passwords
 - c) Smart cards
 - d) Pin
- 7) _____ is not an objective of network security?
 - a) Identification
 - b) Authentication
 - c) Access control
 - d) Lock
- 8) _____ is the entity for issuing digital certificates.
 - a) Certificate Authority
 - b) Cert Authority
 - c) Cert Authorization
 - d) Certificate Authorization
- 9) DES encrypts data in block size of _____ bits each.
 - a) 64 Bits
 - b) 128 Bits
 - c) 32 Bits
 - d) 56 Bits
- 10) 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

B) Fill in the blanks.

- 1) _____ is the kind of firewall is connected between the device and the network Connecting to internet.
- 2) X.509 certificate recommends _____ cryptographic algorithm.
- 3) _____ protocol is used to convey SSL related alerts to the peer entity.
- 4) _____ provides authentication at the IP Level.
- 5) PGP encrypts data by using a block cipher called _____.
- 6) IPSec is designed to provide security at the _____.

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

- a) Define Network Security? Explain Network and Transport Layer Security?
- b) What is mean by Proxy Servers? Explain Firewall setting in Proxy Servers?
- c) Explain Kerberos in Network Security Applications?
- d) Explain Cryptanalysis in Cryptography?

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

- a) What is mean by Ciphers? Explain Symmetric Ciphers and Block Ciphers in Cryptography?
- b) Define the term Web Security? Explain SET and E_mail Security in Web Security?

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

- a) What do mean by Authentication Mechanisms? Explain Passwords and Cryptographic authentication protocols?
- b) Briefly explain RSA and ElGamal in Cryptography?

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

- a) Briefly explain SET and IP Security. in web security?
- b) What is mean by Firewalls? Explain different types of firewalls in details?

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

- a) Briefly explain Model for Internet work Security in network security?
- b) Briefly explain E-mail security and PGPs / MIME in web Security?

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

- a) What is mean by Ciphers? Explain different types of Ciphers in Cryptography?
- b) Briefly explain Packet Filtering and Packet Analysis?

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M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Cloud Computing (MSC18308)

Day & Date: Tuesday, 09-01-2024
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Question 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) Technologies such as cluster, grid, and now, _____ computing, have all aimed at allowing access to large amounts of computing power in a fully virtualized manner, by aggregating resources and offering a single system view.
 - a) Green
 - b) Chip
 - c) Machine
 - d) Cloud
- 2) Cloud Computing denotes a model on which a computing infrastructure is viewed as a "clouds," from which businesses and individuals access applications from _____ in the world on demand.
 - a) Point of Access
 - b) Anywhere
 - c) Geographical location
 - d) Physical location
- 3) _____ clouds are built, operated, and managed by an organization for its internal use only to support its business operations exclusively.
 - a) Public
 - b) Protected
 - c) Private
 - d) Community
- 4) The notion of _____ Center is used, where the it could be an external, internal or federated provider of infrastructure, platform or software services.
 - a) Physical Data
 - b) Server Rack Data
 - c) Cloud Data
 - d) Server Tower Data
- 5) _____ applications, are used to efficiently answer multi-dimensional queries for analysis, reporting, and decision support.
 - a) DLAP
 - b) OLAP
 - c) KLAP
 - d) MLAP
- 6) The _____ segment is typically attractive for small companies or startups that don't have enough capital and human resources to afford internal infrastructures.
 - a) IaaS
 - b) LaaS
 - c) PaaS
 - d) EaaS

- 7) Within the wide range of services offered, it is worth noting that _____ (EC2) and Simple Storage Service (S3) allow users to quickly obtain virtual compute resources and storage space, respectively.
 - a) Amazon Elastic Compute Cloud
 - b) Amazon Electronic Compute Cloud.
 - c) Amazon Electric Compute Cloud.
 - d) Amazon Erasable Compute Cloud.
- 8) Solutions that are completely based on a _____ approach for public clouds are Microsoft Azure and Google App Engine.
 - a) IaaS
 - b) PaaS
 - c) EaaS
 - d) SaaS
- 9) _____ Layer (SSL) is widely used and trusted.
 - a) Software Socket
 - b) System Software
 - c) Secure Socket
 - d) Sensor Socket
- 10) _____ applications differ from earlier distributed computing solutions in that was developed specifically to use web tools like browser.
 - a) PaaS
 - b) IaaS
 - c) SaaS
 - d) CaaS

B) Write true or false.

06

- 1) Amazon Web Services interfaces and do not supports different virtual machine technologies such as Xen, VMWare, and KVM.
- 2) SaaS applications that are not designed to deliver the non-integration service unsecurely over the Internet and are able to integrate machine applications with the not on-premise systems, cloud-to-premise applications.
- 3) Clouds are a large pool of easily usable and accessible virtualized resources.
- 4) To provide IaaS cloud computing service, the provisioning of the cloud infrastructure in data centers is a prerequisite.
- 5) One of the core services provided by cloud computing is data storage.
- 6) Google provides a free limited service and utilizes daily and per minute quotas to meter and price applications requiring professional service.

Q.2 Answer the following

16

- a) What is Internet?
- b) Explain in brief Public Clouds.
- c) What do you mean by Virtual Machine (VM)?
- d) What is PaaS?

Q.3 Answer the following.

- a) Explain in detail Network Level Security as Infrastructure Security?
- b) State and explain various issues in Cloud Computing?

08

08

Q.4 Answer the following.

- a) What do you mean by Cloud? Discuss in detail various types Cloud Service Models with suitable example.
- b) What is Amazon EC2-Renting? State and explain its features.

08

08

Q.5 Answer the following.

- a) Discuss in detail major roles and components of Service Oriented Architecture. **08**
- b) State and explain various Cloud Deployments Models and their advantages. **08**

Q.6 Answer the following.

- a) What is Google App Engine? State and explain its features and advantages? **08**
- b) State and explain different approaches to virtualization. **08**

Q.7 Answer the following.

- a) What is Cloud Computing? Discuss various characteristics and architecture of it. **08**
- b) State and discuss Software as a Service(SaaS) with suitable example. **08**

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M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Mobile Computing (MSC18309)

Day & Date: Tuesday, 09-01-2024
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- 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) 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 of the following offers packet mode data transfer service over the cellular network?
 - a) TCP
 - b) GPRS
 - c) GSM
 - d) None of the above
- 3) Which of the following uses wireless as the mode of communication for transferring or exchanging data between various mobiles over a short-range?
 - a) Ad hoc computing
 - b) Mobile computing
 - c) Bluetooth technology
 - d) None of the above
- 4) 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
- 5) Which of the following is considered as the heart of the Global Systems for Mobiles (or GSM)?
 - a) Networks Switching Sub System
 - b) Operational Support Sub-system
 - c) Base Station Subsystem
 - d) None of the above
- 6) The IMT-2000 is a digital Mobile network that functions as the _____.
 - a) Cordless
 - b) Pager
 - c) Lower earth orbit satellite
 - d) All of the above
- 7) GEO stands for _____.
 - a) Geostationary Earth Orbit
 - b) Geographical Earth Orbit
 - c) Geostructure Element Orbit
 - d) Geostructure earth Orbit
- 8) What is wireless communication?
 - a) Sending data from one location to with the use of physical medium
 - b) Sending data from one location to another without the use of physical medium
 - c) Sending data from one location to another without the use of virtual medium
 - d) None of the mentioned

- 9) WAP provides communication between _____.
 a) Wireless devices and internet
 b) Wired devices and internet
 c) Mobile and Ethernet
 d) Both a and c
- 10) WAP is _____ suite.
 a) Protocol
 b) Message
 c) Security
 d) None of the above

B) Fill in the blanks.

06

- 1) _____ number of sub-systems for Global Systems for Mobile communication.
- 2) The term "HLR" stands for the _____.
- 3) An interconnected collection of piconet is called _____.
- 4) Bluetooth transceiver devices operate in _____ GHz ISM band.
- 5) _____ is a packet oriented mobile data service available to users.
- 6) IEEE _____ standard defines the services that need to be provided by the Wireless LAN.

Q.2 Answer the following

16

- a) Explain Network Signaling in PCS.
- b) Write the applications of Wireless LAN.
- c) Write short note on CDMA 2000.
- d) Write short note on Virtual Private Network.

Q.3 Answer the following.

16

- a) Explain Personal Communication Services Architecture.
- b) What is Mobility Management? Explain the Inter-BS Handoff and Inter- MSC Handoff in PCS.

Q.4 Answer the following.

16

- a) Explain the GPRS architecture.
- b) Explain Wireless Markup Language.

Q.5 Answer the following.

16

- a) Write in details about the Bluetooth Technology.
- b) What is Global Mobile Satellite System? Write its Applications.

Q.6 Answer the following.

16

- a) Explain GSM Call origination and Call Termination Operatons.
- b) Explain the Protocol architecture of IEEE 802.11 standard.

Q.7 Answer the following.

16

- a) Write about the IMT 2000 (3G) Mobile Services and it Vision.
- b) Explain the Case study of the IRIDIUM.

- 10) HTML controls are?
- a) Server-side controls
 - b) Client-side controls
 - c) Both
 - d) none

B) Write True/False. 06

- 1) C# is a type safe programming language.
- 2) Every Server control of ASP.NET must have an id.
- 3) User can not validate textbox data using validation controls.
- 4) Browsers can stores cookies for different websites users visited.
- 5) App_Data folder is used to store DLL files in the ASP.NET application.
- 6) The AutoPostBack is a property for web controls in ASP.NET

Q.2 Write short note on the following. 16

- a) Connection Class
- b) Just In Time Compiler
- c) Reflection
- d) AutoPostBack

Q.3 Answer the following.

- a) Compare with example Client-Side versus Server-Side Validation. 08
- b) What is namespace? How to create and use namespace in .NET? 08

Q.4 Answer the following.

- a) What is file? Explain any two file operations with example. 08
- b) Explain the TextBox, RadioButton and Button Control with example. 08

Q.5 Answer the following.

- a) Explain the architecture of ASP.NET. 08
- b) Explain Life cycle of web page. 08

Q.6 Answer the following.

- a) What is master page? Explain steps to create master page. 08
- b) What is validation? Explain Compare Validator and Range Validator with example. 08

Q.7 Answer the following.

- a) What is state management? Explain server side state management techniques. 08
- b) Explain the Connection object properties and Connection class members? 08

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M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Machine Learning (MSC18402)

Day & Date: Tuesday, 19-12-2023
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- 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) There may be various _____ and we may be interested in finding the most efficient one, requiring the least number of instructions or memory or both.

a) Algorithm	b) Machine
c) User	d) Admin
- 2) Application of machine learning methods to _____ databases is called data mining.

a) Small	b) Medium
c) Large	d) Null
- 3) Finding _____ between products bought by customers: If people who buy X typically also buy Y.

a) Associations	b) Distributions
c) Conjunctions	d) Complements
- 4) _____ learning also helps us find solutions to many problems in vision, speech recognition and robotics.

a) Machine	b) Instruction
c) Information	d) Data
- 5) In medical diagnosis, the inputs are the relevant information we have about the patient and the _____ are the illnesses.

a) Causes	b) Classes
c) Tablets	d) Dosage
- 6) A _____ program groups pixels with similar colors in the same group, and such groups correspond to the colors occurring frequently in the image.

a) Covariance	b) Clustering
c) Coincident	d) Classification
- 7) A _____ navigating in an environment in search of a goal location is another application area of reinforcement learning.

a) Map	b) Person
c) Robot	d) People
- 8) Random Forest is a method that operates by constructing _____ decision trees during the training phase.

a) Single	b) Double
c) Multiple	d) Superior

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M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Data Warehouse and Mining (MSC18403)

Day & Date: Wednesday, 20-12-2023
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- 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 alternative: 10

- 1) _____ add the information from the operational database.
 - a) replication technique
 - b) reengineering technique
 - c) engineering technique
 - d) transformation engineering
- 2) Background knowledge depends on the form of _____.
 - a) theoretical knowledge
 - b) hypothesis
 - c) formulae
 - d) knowledge representation
- 3) Expert systems are _____.
 - a) system that contains the knowledge of specialists
 - b) system that can think of its own
 - c) system that can work
 - d) system that can create knowledge
- 4) In _____ approach, a data warehouse is built first and all information needed is selected.
 - a) top-down.
 - b) client/server.
 - c) bottom-up.
 - d) DSS
- 5) _____ is an example of case-based learning.
 - a) decision trees
 - b) neural networks
 - c) genetic algorithm
 - d) k-nearest neighbour
- 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) KDD describes the _____.
 - a) the whole process of extraction of knowledge from data
 - b) extraction of data
 - c) extraction of information
 - d) extraction of rule
- 8) KDD describes the _____.
 - a) the whole process of extraction of knowledge from data
 - b) extraction of data
 - c) extraction of information
 - d) extraction of rule

- 9) K-nearest neighbour is one of the _____.
 a) learning technique b) OLAP tool
 c) purest search technique d) data warehousing tool
- 10) The star scheme consists of single fact tables.
 a) True
 b) False

B) Fill in the blank. 06

- 1) _____ analysis divides data into groups that are meaningful, useful or both.
- 2) Association rules are always defined on _____.
- 3) _____ is used to find relationships between multidimensional data.
- 4) Removing duplicate records is a process called _____.
- 5) The _____ operation is used to increase the data cube by one or more dimensions.
- 6) The cuboid that holds the lowest level of summarization is called _____.

Q.2 Answer the following. 16

- a) What is the difference between a data OLTP and OLAP?
- b) Why there is a need for data cleaning?
- c) Write a short note on OLAP servers.
- d) Write a short note on DataMart.

Q.3 Answer the following. 16

- a) Define Data warehouse. Explain various OLAP operations with example.
- b) What is data mining? Explain various issues in data mining.

Q.4 Answer the following. 16

- a) How frequent pattern is mined? Explain the Apriori algorithm with an example.
- b) What is a data warehouse? Explain the data warehouse architecture in detail.

Q.5 Answer the following. 16

- a) Explain the decision tree induction method with an example.
- b) What is meant by Unsupervised learning? Explain with example

Q.6 Answer the following. 16

- a) Explain data visualization in detail.
- b) Explain the Bayesian classification algorithm with a suitable example.

Q.7 Answer the following. 16

- a) What is Binning technique? Explain with an example.
- b) Explain different types of hierarchical clustering methods.

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M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Soft Computing (MSC18409)

Day & Date: Thursday, 21-12-2023

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) Which of the following is associated with fuzzy logic?
 - a) Crisp set logic
 - b) Many-valued logic
 - c) Two-valued logic
 - d) Binary set logic
- 2) The truth-values of fuzzy logic is termed as _____.
 - a) Either 0 or 1
 - b) Between 0 & 1
 - c) Neither 0 nor 1
 - d) Between 2&3
- 3) Which of the following represents the values of set membership?
 - a) Degree of truth
 - b) Probabilities
 - c) Discrete set
 - d) Both a & b
- 4) _____ represents the fuzzy logic.
 - a) IF-THEN rules
 - b) IF-THEN-ELSE rules
 - c) Both a & b
 - d) None of the above
- 5) Uncertainty can be represented by _____.
 - a) Entropy
 - b) Fuzzy logic
 - c) Probability
 - d) All of the above
- 6) A perceptron can be defined as _____.
 - a) A double layer auto-associative neural network
 - b) A neural network with feedback
 - c) An auto-associative neural network
 - d) A single layer feed-forward neural network with preprocessing
- 7) What is meant by an auto-associative neural network?
 - a) A neural network including feedback
 - b) A neural network containing no loops
 - c) A neural network having a single loop
 - d) A single layer feed-forward neural network containing feedback

- 8) What is the name of the operator that is functioned on the population?
 - a) Recombination
 - b) Reproduction
 - c) Mutation
 - d) None of the above
- 9) Which of the following best relate to reinforcement learning?
 - a) Error based learning
 - b) Backpropagation learning
 - c) Output-based learning
 - d) None of the above
- 10) What is purpose of Axon?
 - a) Receptors
 - b) Transmitter
 - c) Transmission
 - d) none of the mentioned

B) State True or False.

06

- a) A Fuzzy logic is an extension to the Crisp set, which handles the Partial Truth.
- b) In contrast to conventional computers, neural networks have much higher computational rates.
- c) Neural networks or fuzzy logic are part of hardware.
- d) Activation models are static.
- e) Soft Computing is based on binary logic.
- f) In supervised learning models are trained on labelled data.

Q.2 Answer the following.

16

- a) What is Artificial Neuron?
- b) What is fuzzy system?
- c) What is Crossover operation of Genetic Algorithm?
- d) What is crisp set? Give examples.

Q.3 Answer the following.

16

- a) Let R, S be defined on the sets $\{1, 3, 5\} \times \{1, 3, 5\}$
 Let R: $\{(x, y) \mid y = x + 2\}$ S: $\{(x, y) \mid x < y\}$
 - i) Represent a Relation Matrix.
 - ii) Find out Max - Min Composition
- b) Explain Steepest descent method.

Q.4 Answer the following.

16

- a) Consider following fuzzy sets.
 $\tilde{A} = \{(X_1, 0.5), (X_2, 0.7), (X_3, 0)\}$ and $\tilde{B} = \{(X_1, 0.8), (X_2, 0.2), (X_3, 1)\}$
 Solve the following:
 - i) $\tilde{A} \cap \tilde{B}$
 - ii) $\tilde{A} \cup \tilde{B}$
- b) Explain different types of neural networks.

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

- a) Explain alpha cuts with suitable example.
- b) Consider following fuzzy sets over Universal Set $X = \{a, b, c, d, e\}$
Membership for Set $A = \{(a, 0.3), (b, 0.7), (c, 0.9), (d, 0.8), (e, 0.0)\}$
Membership for Set $B = \{(a, 0.7), (b, 0.3), (c, 0.8), (d, 0.5), (e, 1.0)\}$
Membership for Set $C = \{(a, 0.2), (b, 0.0), (c, 0.0), (d, 1.0), (e, 0.5)\}$
Find out:
i) $A \cup B$
ii) $A \cap B \cap C$

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

- a) Explain any two real life applications of rough set.
- b) Explain Tournament Selection application of GA with suitable example.

Q.7 Write The followings:**16**

- a) Write the different applications of neural network.
- b) Differentiate between fuzzy set and rough set

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M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
COMPUTER SCIENCE
Block chain Technology (MSC18410)

Day & Date: Thursday, 21-12-2023
 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- 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. (MCQ) 10

- 1) Blockchain is a peer-to-peer _____ distributed ledger technology that makes the records of an digital asset transparent and unchangeable.
 - a) Decentralized
 - b) Demanding
 - c) Popular
 - d) None of these
- 2) Cryptography keys consist _____.
 - a) Private Key
 - b) Public Key
 - c) Both of these
 - d) None of these
- 3) Smart Contract characteristics do not include:
 - a) Fast and cost-effective
 - b) high degree of accuracy
 - c) Transparency
 - d) Alterable
- 4) What is a DApp?
 - a) condiment
 - b) type of cryptocurrency
 - c) type of blockchain
 - d) Takes an input of any length and returns a fixed-length
- 5) What is the genesis block?
 - a) Any block created by the founder
 - b) The last block created in the Blockchain
 - c) The first block of a Blockchain
 - d) decentralized application
- 6) P2P Stand for _____.
 - a) Password to Protect
 - b) Protection to Product
 - c) Peer to Peer
 - d) Private Key to Public Key
- 7) Who created Ethereum.
 - a) vitalik buterin
 - b) Satoshi Nakamoto
 - c) John Mcafee
 - d) None of these
- 8) EVM stands for _____.
 - a) Ethereum virtual machine
 - b) Electronic Virtual Machine
 - c) E voting machine
 - d) None of these
- 9) Where do you store your cryptocurrency?
 - a) Wallet
 - b) Floppy Disk
 - c) Bank account
 - d) None of these

- 10) In _____ hackers generate numerous fake network nodes.
- a) Sybil attack
 - b) Phishing attack
 - c) Both of these
 - d) None of these

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

- 1) it is possible to modify the data once it is written in a block.
 - a) True
 - b) False
- 2) Bitcoin is a cryptocurrency, which is an application of Blockchain.
 - a) True
 - b) False
- 3) Decentralized blockchains are immutable?
 - a) True
 - b) False
- 4) A node is computer on blockchain network.
 - a) True
 - b) False
- 5) In Bitcoin in order to communicate, the opcodes (OP CODES) not used.
 - a) True
 - b) False
- 6) Hyperledger Fabric is not an open source framework.
 - a) True
 - b) False

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

- a) Consensus algorithm methods.
- b) Distributed Ledger.
- c) Bitcoin.
- d) Sharding.

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

- a) What is Blockchain Technology? Explain features of blockchain technology.
- b) Explain Cryptography keys in detail?

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

- a) State difference between Proof of Work (PoW) and Proof of Stake (PoS).
- b) What are Security issues in Blockchain? Explain in detail.?

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

- a) What is Verifiable Random Functions (VRF)? Explain in detail.
- b) State difference between Bitcoin and Ethereum?

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

- a) Explain blockchain 3.0 with Hyperledger fabric?
- b) What is Permissioned Blockchain? How access control is implemented in Permissioned Blockchain?

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

- a) What is Zero-Knowledge Systems (ZKS)? Explain in detail?
- b) What is difference between Blockchain 1.0 and Blockchain 2.0?