2/16

2110N716

Candidate's Seat No :_____

B.Sc Sem.-3 Examination

CC-201

Computer Science

October-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Q1(A) Explain the concept of inheritance in C++. Write a C++ program to demonstrate multiple inheritance, highlighting any potential issues that can arise. (7)

Q1(B) Discuss the significance of virtual functions in C++. Provide a program that illustrates the need for virtual functions using a base and derived class. (7)

OR

Q1(A) Describe polymorphism in C++ with suitable examples. Write a program demonstrating both compile-time and run-time polymorphism. (7)

Q1(B) Explain the concept of operator overloading in C++. Write a C++ program to overload the + operator to add two complex numbers. (7)

Q2(A) What are constructors and destructors in C++? Write a C++ program to demonstrate the use of default, parameterized, and copy constructors. (7)

Q2(B) Discuss the importance of encapsulation in OOP. Provide a C++ example that illustrates encapsulation using access specifiers. (7)

OR

Q2(A) Explain the concept of abstract classes in C++. Write a C++ program that demonstrates the use of abstract classes and pure virtual functions. (7)

Q2(B) Describe the role of this pointer in C++. Write a C++ program that uses the this pointer in various contexts. (7)

Q3(A) Explain the concept of exception handling in C++. Write a program that handles multiple exceptions and uses user-defined exceptions. (7)

Q3(B) Discuss the differences between deep copy and shallow copy. Write a C++ program to demonstrate both concepts. (7)

OR

Q3(A) Explain the significance of namespaces in C++. Write a program to demonstrate how namespaces can help avoid naming conflicts. (7)

Q3(B) Describe friend functions in C++. Write a program that demonstrates the use of a friend function to access private members of a class. (7)

Q4(A) Explain the difference between stacks and queues. Write a C++ program to implement both a stack and a queue using arrays. (7)

Q4(B) Discuss the concept of linked lists. Write a C++ program to implement a singly linked list and perform insertion, deletion, and traversal operations. (7)

OR

Q4(A) Explain the concept of binary trees. Write a C++ program to create a binary search tree (BST) and perform in-order, pre-order, and post-order traversal. (7)

Q4(B) Discuss the different types of sorting algorithms. Write a C++ program to implement the quicksort algorithm and analyze its time complexity. (7)

Q5 MCQ Attempt any seven out of twelve.(2 Marks each) (14)

P.T.O

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1) Which of the following is not a feature of OOP in C++?
   a) Encapsulation b) Polymorphism c) Inheritance d) Compilation
2) Which of the following is true about constructors in C++?
   a) A constructor can return a value.
   b) A constructor can be virtual.
   c) A constructor can be overloaded.
   d) A constructor can be inherited.
3) Which keyword is used to prevent a class from being inherited?
   a) protected b) private c) final d) static
4) What is the size of a pointer in a 64-bit system?
   a) 2 bytes b) 4 bytes c) 8 bytes d) 16 bytes
5) Which of the following is not a type of inheritance in C++?
   a) Single b) Multiple c) Multilevel d) Dual
6) Which of the following statements is true about virtual functions?
   a) Virtual functions must be defined in the base class.
   b) Virtual functions can be static.
   c) A class with a virtual function cannot be instantiated.
   d) Virtual functions are resolved at compile time.
7) What is the default access level for members of a class in C++?
   a) public b) private c) protected d) static
8) Which of the following is true about pure virtual functions?
   a) They must have a body.
   b) They make a class abstract.
   c) They can be static.
   d) They can have default parameters.
9) In C++, what is the correct way to declare a pointer to a function that returns an integer and takes two integers as arguments?
   a) int (*func)(int, int);
   b) int func*(int, int);
   c) int* func(int, int);
   d) int &(func)(int, int);
10) Which of the following operator cannot be overloaded in C++?
    a) + b) :: c) == d) =
11) Which of the following is correct about C++ friend functions?
    a) Friend functions can access private and protected members of a class.
    b) Friend functions can be called using the object of the class.
    c) Friend functions can be virtual.
    d) Friend functions are inherited in derived classes.
12) Which type of polymorphism is supported by method overloading in C++?
    a) Compile-time b) Runtime c) Dynamic d) Static

ALL THE BEST