Code : 100313

B.Tech 3rd Semester Exam., 2021

(New Course)

OBJECT ORIENTED PROGRAMMING USING C++

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Answer any *seven* questions : 2×7=14

(a) How will you take input in C++?

(b) How will you define a constructor in a C++ class?

(c) What are accessor and mutator functions?

(d) What is void pointer in C++? Elaborate with an example.

(e) What is derived data type in C++?

(f) How will you implement runtime polymorphism in C++?

(g) When are virtual base classes necessary in C++?

(h) What are the differences between function overloading and function overriding?

(i) How will you throw an exception in C++? Elaborate with an example.

(j) Name two standard exceptions built in C++. When are they thrown?

2. (a) What are the advantages of object-oriented programming paradigm over procedural programming? Demonstrate the features of an object-oriented programming paradigm with their suitable implementations in C++. 6

(b) How will you define constants in C++? How will you access them? Elaborate with suitable examples. 2

(c) What is type modifier? Elaborate different types of modifiers in C++ with proper examples. 4

(d) Is it possible to have virtual constructor in C++? If yes, how will you implement it, and if no, why? 2

3. (a) What do you mean by call by reference? What are the differences between call by value and call by reference? Show call by reference by implementing a function to swap the values of two numbers. 5

(b) What do you mean by default arguments? Can you use functions with default arguments as an alternative to function overloading? Elaborate with suitable examples. 5

(c) What is a copy constructor? When will you need a copy constructor? How will you implement a copy constructor? Elaborate with suitable examples. 4

4. (a) What is 'this' pointer? How will you use 'this' pointer in C++? Elaborate with example. 4

(b) What are various access specifiers used in C++? Demonstrate each of them with suitable examples. 5

(c) How will you allocate dynamic memory in C++ other than malloc or calloc? How will you free the memory created using the method demonstrated? Demonstrate with suitable examples. What are the differences between malloc and the method you demonstrated? 5

5. (a) How do you overload operators in C++? Demonstrate with a suitable example, in which one unary operator and one binary operator will be overloaded. 4

(b) How will you overload the input operator >> and the output operator <<? Demonstrate with suitable examples. 4

(c) Demonstrate friend function and friend class with suitable examples. 4

(d) What is namespace? How will you define a namespace in C++? 2

6. (a) What is virtual function? Why are they necessary? Demonstrate compile-time binding and late-time binding using suitable examples. 5

(b) What is inline function? How do you declare and invoke an inline function in C++? 3

(c) What is pure virtual function? Elaborate pure virtual function and abstract class with suitable examples. 6

7. (a) How will you declare a dynamic array in C++? Demonstrate. What is 'nothrow' keyword used for? 3

(b) Can you overload new and delete operators? If yes, demonstrate with a suitable example. If not, why? 4

(c) What is a reference? What are the differences between a pointer and a reference? Demonstrate with a suitable example of object pointer and object reference. 4

(d) What is diamond problem faced in multiple inheritance? How to deal with this problem in C++? Demonstrate with an example. 3

8. (a) What is template? In which scenario, using templates are advantageous? Demonstrate with suitable examples. 3

(b) How will you declare a function template? Demonstrate with suitable examples. 4

(c) How will you declare a class template? Demonstrate with suitable examples. 4

(d) How can you handle any type of exception in catch block in C++? Demonstrate with an example. 3

9. (a) How will you create your own exception class in C++? Demonstrate. What is the functionality of what() function in creating own exception class? 5

(b) How does stack unwinding work in C++? Demonstrate with a suitable example. 5

(c) Demonstrate nested try blocks in C++ with suitable example. Can an exception thrown by internal try block be caught by external catch clause? Can an exception thrown by external try block be caught by internal catch clause? In both cases, demonstrate with suitable examples. 4

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