KATHMANDU UNIVERSITY
End Semester Examination [C]
January 2025

Marks Scored:

Level : B.E./B.Sc.
Year : I

Course : COMP 116
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date : 12 JAN 2025

SECTION "A"
[20Q. × 0.5 = 10 marks]

***Choose and encircle the most appropriate answer. Symbols have their usual meanings.***

1. What type of programming language 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

2. Identify the correct extension of the user-defined header file in C++
   a. .cpp b. .hg c. .h d. .hf

3. In Object Oriented Programming, what does encapsulation refer to?
   a. Storing data in arrays
   b. The process of inheritance
   c. hiding necessary information
   d. Combining data and methods

4. What is the output of the following code:

```
class Test{
    int x;
};
int main()
{
  Test t;
  cout << t.x;
  return 0;
}
```

   a. Compiler Error b. 0 c. Garbage Value d. undefined

5. Which of the following is true?
   a. All objects of a class share all data members of class
   b. Objects of a class do not share non-static members. Every object has its own copy.
   c. Objects of a class do not share codes of non-static methods, they have their own copy
   d. Objects are independent

6. What is the order of constructor and destructors calls in C++:
   a. Constructors: Derived to Base, Destructors: Base to Derived
   b. Constructors and Destructors follow the same order
   c. Constructors: Base to Derived, Destructors: Derived to Base
   d. Constructors: Derived to Base, Destructors: Derived to Base

7. Which of the following statements is true about constructors?
   a. Has no return type
   b. Cannot contain a function call
   c. Has a return type
   d. Has a void return type

8. Which of the following operator(s) cannot be overloaded?
   a. . (Member Access or Dot operator)
   b. ?: (Ternary or Conditional Operator )
   c. :: (Scope Resolution Operator)
   d. All of the above

9. What is the do-while loop also known as?
   a. Exit control
   b. Entry control
   c. Per tested
   d. All of the above

10. Which is the correct statement about operator overloading?
   a. Only arithmetic operators can be overloaded
   b. Only non-arithmetic operators can be overloaded
   c. Precedence of operators are changed after overloading
   d. Associativity and precedence of operators does not change

11. Which among the following best defines single level inheritance?
   a. A class inheriting a derived class
   b. A class inheriting a base class
   c. A class inheriting a nested class
   d. A class which gets inherited by 2 classes

12. Which is the correct syntax of declaring a virtual function?
   a. virtual int func();
   b. virtual int func(){};
   c. inline virtual func();
   d. inline virtual func(){};

13. Base class _____
   a. can be made abstract
   b. can't be made abstract
   c. must be abstract
   d. if made abstract, compile time error occurs

14. _____ binding means that an object is bound to its function call at compile time.
   a. late
   b. static
   c. dynamic
   d. fixed

15. If we attempt to dereference an uninitialized pointer, it will _____ by referring to any other location in memory.
   a. cause a compile-time error
   b. run time error
   c. cause run time error
   d. executes

16. _____ is a member function that is declared within a base class and redefined by derived class.
   a. virtual function
   b. static function
   c. friend function
   d. const member function

17. Which of the following is used for generic programming?
   a. Virtual functions
   b. Modules
   c. Templates
   d. Abstract Classes

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18. Which of the following is **CORRECT** about templates?
    a. It is a type of runtime polymorphism
    b. It allows the programmer to write one code for all data types
    c. Helps in object oriented programming
    d. makes the program run faster

19. If the inner catch handler is not able to handle the exception then_____ .
    a. Compiler will look for outer try handler
    b. Program terminates abnormally
    c. Compiler will check for appropriate catch handler of outer try block
    d. None of these

20. Generic catch handler is represented by _____ .
    a. catch(..,) b. catch(---) c. catch(…) d. catch( void x)

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SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.*Write the answers in your own words as far as practicable. The figures in the margin indicate full marks.*

1. What are the advantages of object oriented programming over procedural programming? Discuss the important features of OOP. [1+3=4]

2. Design a class Player. The player class has the following data members to store information:
player_Name
jersy_no
country
email_address
Write a program to define a player class. Define constructor and appropriate methods to get player information and display the same on the screen. [4]

3. What are the different types of constructors available in C++, provide examples of each. Can you have more than one constructor in a class? [3+1=4]

4. Create a parent class called Rectangle that has data members: length and breadth of type float. The class has the member functions: void setlength(float) and void setbreadth(float) to set the length and breadth respectively.
Create a child class called Calculate from above base class that has the following member functions: float perimeter() to return the perimeter of the rectangle, float area() to return the area of the rectangle, and void show() to display the length and breadth of the rectangle.
Write a main function to create two objects of the rectangle class. Set the length and breadth of the first rectangle to 10 and 7.5. Set the length and breadth of the second rectangle to 12.5 and 10. Display the rectangles each with their area and perimeter. [4]

5. Write a program to overload the unary increment operator ++ both as a prefix and postfix increment operator. [4]

6. When should a program throw an exception? Give appropriate examples. Explain the mechanism of exception handling in C++? [4]

7. Write short notes on (***ANY TWO***): [2×2=4]
   a. Friend Function
   b. Abstract Class
   c. Type conversion

**P.T.O.**

## SECTION "C"

[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8.

a. What is the importance of inheritance in OOP? Draw a chart to show how the private, public and protected members of the parent class are accessed in child class with private, public and protected modes of inheritance. [1+3 =4]

b. Assume that a bank maintains two kinds of accounts for customers, one called a Saving account and the other as a Current account. The Saving account provides interest and withdrawal facilities. The Current account provides withdrawal but no interest.

Create a class Account that stores customer name, account number and type of account. From this derive classes Current_Account and Saving_Account to make them more specific to their requirements. Include necessary constructor, destructor and member functions to achieve following tasks: [4]

i. Create an instance of the class and display customer details.
ii. Accept deposits from a customer and update the balance.
iii. Display the balance
iv. Compute and deposit interest.

9. What is polymorphism? How is polymorphism achieved at compile time and run time, explain with an example program for each. Differentiate between compile time polymorphism and run time polymorphism. [1+4+3=8]

10.

a. What is generic programming? Give examples of function template and class template. [4]

b. Write a class template that shows the working of a calculator. [4]