KATHMANDU UNIVERSITY
End Semester Examination
August, 2019

Mark scored:

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

Course : COMP 116
Semester : II

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Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date AUG 27 2019

SECTION "A"

[20Q × 0.5 = 10 marks]

Encircle the most appropriate answer.

1. The C++ header file _____ contains function prototypes for the standard input and standard output functions.
   a. <cmath>
   b. <fstream>
   c. <cstdio>
   d. <iostream>

2. The act of representing essential features without including the background explanations is called _____.
   a. Abstraction
   b. Encapsulation
   c. Polymorphism
   d. Inheritance

3. Object oriented programming gives priority to ____.
   a. Data
   b. Function
   c. Both a and b
   d. None of the mentioned

4. If class A is friend of class B and class B is friend of class C then, which of the followings is true?
   a. Class C is friend of class A
   b. Class A is friend of class C
   c. Class A and Class C do not have friend relationship
   d. None of the above

5. The output of following code segment is _____.

```
int a = 10;
int b = 10;
cout << (a>b?a:b);
```

   a. Syntax Error
   b. 5
   c. 10
   d. None of the mentioned

6. Default access specifier for data members of a class is _____ .
   a. Protected
   b. Public
   c. Internal
   d. Private

7. A function declaration inside a class gives importance to _____ of arguments.
   a. type
   b. type and identifier
   c. type and name
   d. variable

8. How do we define a destructor for a class A?
   a. A~( ){ }
   b. ~A( ){ }
   c. A( ){ }~
   d. A( )~{ }

9. The use of an object of one class in definition of another class is called _____.
   a. Encapsulation
   b. Inheritance
   c. Abstraction
   d. Composition

10. Consider the following three classes

```
class A
{.........};

class B
{.........};

class C : public B, public A
{.........};
```

Which is the order of invocation of constructors when an object of class C is instantiated?

   a. first B(), then A(), and then C()
   b. only C() is invoked
   c. first C(), then B(), and then A()
   d. first A(), then B(), and then C()

11. If class A is inheriting class B as, Class A: B then _____.
   a. Public members of B becomes protected members of A
   b. Private members of A becomes public members of B
   c. Protected members of B becomes private members of A
   d. Public members of B becomes public members of A

12. Rethrowing an exception should _____.
   a. Have argument as mandatory in throw keyword
   b. Have multiple catch section
   c. Have keyword used "rethrow"
   d. Have nested block of try and catch

13. Virtual function is used to _____.
   a. deal ambiguous scenario in sub-ordinate class
   b. deal non-ambiguous scenario in super class
   c. achieve run time polymorphism
   d. create abstract class

14. Which of the followings is true?
   a. Parameterized constructor should take arguments by pass by reference
   b. We can send argument by pass by value to copy constructor
   c. We must send argument by pass by reference to copy constructor
   d. We can send argument to copy constructor by both pass by value and pass by reference.

15. How can we initialize private base class variables from a derived class constructor?
   a. We can assign values to the variables directly in the derived class constructor
   b. We can call the base class constructor inside the { } of the derived class constructor
   c. We can call the base class constructor after the function header of the derived class constructor, with a : in-between the two
   d. It is not possible to initialize private base class variables from a derived class constructor

16. Template in C++ _____.
    a. is way of achieving procedural programming
    b. is way of achieving generic programming
    c. is way of achieving object oriented programming
    d. is way of achieving run time polymorphism

17. Which of the followings operators cannot be overloaded?
    a. ?: b. == c. ! d. +

18. Which of the followings cannot be considered as polymorphism in OOP?
    a. Function Overloading
    b. Operator Overloading
    c. Constructor Overloading
    d. Function Overriding

19. Static linkage of base class pointer with base class members can be avoided by using _____
    a. Virtual base class
    b. Abstract class
    c. Virtual function
    d. derive class pointer

20. For overloading A++, the operator overloading is defined as _____.
    a. Return-type operator ++( )
    b. Return-type operator ++(int)
    c. Friend Return-type operator ++ ( )
    d. Friend Return-type operator ++ (int)

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Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 116
Semester : II
F. M. : 40

SECTION "B"
[6Q × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. How are data and functions organized in object oriented programming?

2. Write a program to create a class called "Province". Create an array of objects which stores information about seven provinces of Nepal as given below:
   Province name: State 3
   Area: 20,300 sq km
   Population: 5529452
   Store information of all seven provinces and display the information as in the above format. Make necessary assumptions for Area and Population.

3. Write a program to define two inline functions using concept of function overloading. One function returns area of a circle having radius of "R" and an another function returns area of a rectangle having length of "L" and breath of "B".
   [Area of circle: 3.14×R×R, Area of Rectangle: L×B]

4. Describe in brief about two levels of access control over class members in inheritance.

5. With an example, briefly explain the initialization of base class data members by using derive class constructor.

6. How does pure virtual function help to achieve abstraction? Explain with appropriate example.

7. Write short notes on:
   a. Re-throwing an exception b. Function Template

SECTION "C"
[2Q × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. a. Describe the mechanism of accessing public data members and member functions for the following cases:
      i. Inside the main program [1]
      ii. Inside a member function of the same class [1.5]
      iii. Inside a member function of another class [1.5]
   b. What sort of ambiguity can be addressed by the use of virtual base class? Explain it with diagram. [4]

9. Write a program to define a class "Length" which has data members: feet and inches. Define appropriate constructors to initialize objects of the class. Implement concept of operator overloading to add two objects of the class "Length". Write well driven program to set and display values of the objects. [8]
   (Hint: Check the condition *12 inches= 1 foot* inside the overloading function.
   If L1=2 feet 9 inches, L2=3 feet 9 inches, L3=L1+L2 then L3=6 feet 6 inches)

10. a. Write a program to handle an exception where if user enters an alphabetic character, the program displays welcome message and if user enters numerical character, it displays error message. [4]

b. Write in brief about static data member of a class. How does a static method access static data member of a class? Explain with appropriate example. [1+3]