KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2022

Marks Scored:

Level : B.E./ B.Sc./B.Tech.
Year : I
Course : COMP 116
Semester : II
Exam Roll No. :
Time: 30 mins.
F. M. : 10
Registration No.:
Date : June-06-022

SECTION "A"
[20Q. × 0.5 = 10 marks]

Encircle the most appropriate option among the given choices.

1. Which of the following function definition is not included inside a class?
   a. Static function
   b. Friend function
   c. Const function
   d. Virtual function

2. In C++ Program, inline functions are expanded during _____.
   a. run time
   b. compile time
   c. debug time
   d. coding time

3. A normal C++ operator that acts in special ways on newly defined data types is said to be
   a. Glorified
   b. Classified
   c. Encapsulated
   d. Overloaded

4. What are mandatory parts in function declaration?
   a. return type,function name
   b. return type,function name,parameters
   c. both a and b
   d. none of the mentioned

5. How many ways of passing a parameter are there in C++?
   a. 1
   b. 2
   c. 3
   d. 4

6. What will happen while using pass by reference?
   a. The values of those variables are passed to the function so that it can manipulate them
   b. The location of the variable in memory is passed to the function so that it can use the same memory area for its processing
   c. Changes in parameters will not be intact
   d. Manipulation in different memory locations of parameters

7. Which one is the main purpose of the destructor?
   a. Kill the class
   b. Destruct the object
   c. Deallocate and clean up resources occupied by an object
   d. Deallocate and clean up resources occupied by a class

8. If new keyword is used in default constructor, its paired delete keyword will be appropriate to use in _____.
   a. parameterized constructor
   b. copy Constructor
   c. member function of the class
   d. destructor of the class

9. Object oriented programming gives priority to _____ of data.
   a. characteristics b. operations c. Both a and b d. behaviour

10. How can a static member function "show()" of a class A be accessed from main function where B is an object of class A ?
   a. B::show() b. B:show c. A::show d. A::show()

11. Consider the following three classes

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

What is the order of invocation of constructors when an object of class C is instantiated?
   a. B(), A(), C() b. only C() is invoked
   c. C(), B(), A() d. A(), B(), C()

12. 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)

13. Which of the following operator cannot be overloaded?
   a. Bitwise operator b. Relational Operator
   c. Conditional Operator d. Arithmetic operators

14. If class A is inheriting class B in a way, Class A: B then _____.
   a. Public members of B become 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 become public members of A

15. 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

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

17. Diamond Problem in C++ can be solved using _____.
a. virtual function b. virtual base class c. inheritance d. polymorphism

18. What is a form of software reuse in which the programmer creates a class from the existing one?
a. Abstraction b. Inheritance c. Encapsulation d. Polymorphism

19. An abstract class is useful when _____.
a. no classes should be derived from it
b. no objects should be instantiated from it
c. you want to defer the declaration of the class
d. there are multiple paths from one derived class to another

20. Template is used to achieve _____ in OOP.
a. generic Programming b. functional Programming
c. modular Programming d. hierarchical programming

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Year : I
Time : 2 hrs. 30 mins.

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Semester : II
F.M. : 40

SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Differentiate Structured Programming with Object Oriented Programming.
2. Explain the advantages and disadvantages of using inline function using appropriate syntax. Also show that how an inline function can be used?
3. Briefly explain about data members and member functions of a class. Illustrate how to use static data members of a class.
4. What are the main purposes of using constructor and a destructor in any class? Explain with appropriate example.
5. What are the significances of operator overloading? Write a program to overload unary postfix operator using a friend function.
6. Write a program to derive three classes privately, protectively and publicly from a class and show the accessibility of different data members and member functions of those classes.
7. Write a class template which can display the largest value and average value of elements stored in any array.

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Write a program to deal food orders of a restaurant and calculate bill amount having following details:
Define a class "Food" having data members
DishName: string data type
Price: int data type
and class "**TableInfo**" having data members:
TableNo: Unique integer data member
Menu: Data member which is an array object of class "Food"

The third class "**BillAmount**" which is derived from class "**TableInfo**" and has data members: **NetAmt**: Bill amount of food, **VAT**: 13 % of NetAmt, **ServiceCharge**: 10% of NettAmt and **GrossAmt** = NettAmt + VAT + ServiceCharge.
Create an array to store information about customers at 5 different table. Using runtime polymorphism, write a program to display bill of each table detailing NetAmt, VAT, ServiceCharge and GrossAmt. [Make necessary assumptions] [3+5]

9. Briefly explain static binding and dynamic binding. Describe the rules of calling constructor and initializing base class data members. [Use the concept of inheritance] [4+4]

10. a. Write in brief about copy constructor and mention its limitations. [4]

b. Write a program to create a class which can store information about a height of a place in meters and centimeters format. Initialize the data members using appropriate parameterized constructors.

Create three objects "MtEverest", "BaseCamp" and "HeightfromBaseCamp".

"MtEverest" stores the height of the top of Everest in meters and centimeters.

"BaseCamp" stores the height of the base camp of Mt. Everest in meters and centimeters..

"HeightfromBaseCamp" is an object after subtracting "BaseCamp" from "MtEverest".

Write an appropriate operator overloading function to calculate height of Mt. Everest from Base Camp using a friend function. [4]