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No of MCQs	20
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BACHELOR OF SCIENCE HONORS IN ENGINEERING

INTAKE 38 – 2ND SEMESTER EXAMINATION 2022

OBJECT ORIENTED PROGRAMMING

(IT 2022)

Instructions:

Duration: 02 Hours

The paper contains **Part A** and **B**.

Answer **both** Part A and B

The Part A contains **20 MCQs** and in each of the question **1** to **20**, pick one of the alternatives from **i, ii, iii, iv** which is **correct** and **mark your response in the provided answer sheet with a cross (x)**.

Answer **Part B** in the provided answer book.

Calculators are **Not Allowed**.

If you have any doubts about the interpretation of the wording of a question, make your own decision, but clearly state it on the answer script.

Part A

1. The language that can execute a set of instructions directly by the computer's CPU is known as

- i. Programming language
- ii. Assembly language
- iii. Machine language
- iv. High-level language

2. Which of the following is an assembly language?

- i. LISP
- ii. x86
- iii. Prolog
- iv. C

3. Which of the following is not a disadvantage of POP (Procedural Programming Language)

- i. No data hiding
- ii. Doesn't model the real-world problem very well
- iii. Global data access
- iv. Dividing the program into multiple functions

4. Consider the following statements

- A. Object is the basic unit of OOP (Object Oriented Programming)
- B. Class is an instance of an object
- C. States and behaviors are characteristics of an object

Which of the above statements is/are correct?

- i. A only
- ii. B only
- iii. A and C only
- iv. All A, B and C

5. Which of the following is not a concept of OOP (Object Oriented Programming)

- i. Functions
- ii. Polymorphism
- iii. Objects
- iv. Data Abstraction

6. is a special type of member function used to initialize objects of the class

- i. this Pointer
- ii. Main function
- iii. Constructor
- iv. Destructor

7. Consider the C++ code given below and identify the class name, object and variable(s) which are mentioned using A, B and C respectively.

```
class Parameters {  
public:  
int x,y,z;  
};  
  
int main() {  
Parameters para;  
para.x = 10;  
para.y = 20;  
para.z = 40;  
return 0;  
}
```

- i. A – Para, B – para, C – x,y,z
- ii. A – Parameters, B – para, C – x,y,z
- iii. A – parameters, B – para, C – x,y,z
- iv. A – Parameters, B – Para, C – x,y,z

8. Which of the following is not a C++ constructor

- i. Static constructor
- ii. Copy constructor
- iii. Default constructor
- iv. Parameterized constructor

9. Which of the following access specifiers are only used to implement data abstraction using C++?

- i. Public and Private Access Specifiers
- ii. Public and Protected Access Specifiers
- iii. Private and Protected Access Specifiers
- iv. Public, Private and Protected Access Specifiers

10. Which of the following statements are correct about destructors?

- A. They are used to destroy objects
 - B. Destructor name is same as the class name
 - C. Have return types
 - D. Preceded using a tilde (~)
- i. A and B only
 - ii. B and C only
 - iii. A, B and C only
 - iv. A, B and D only

11. Consider the following C++ code and select the correct output

```
#include <iostream>
#include<math.h>
using namespace std;
int main()
{
    int a = 4;
    int power = 3;
    int result = pow(a,power);
    std::cout << "Cube of n is : " << result<< std::endl;
    return 0;
}
```

- i. 64
- ii. 12
- iii. 27
- iv. 4

12. Which of the following OOP concept is related with the “data hiding” principle

- i. Data Abstraction
- ii. Encapsulation
- iii. Composition
- iv. Polymorphism

13. Consider figure 1 and select the correct inheritance type

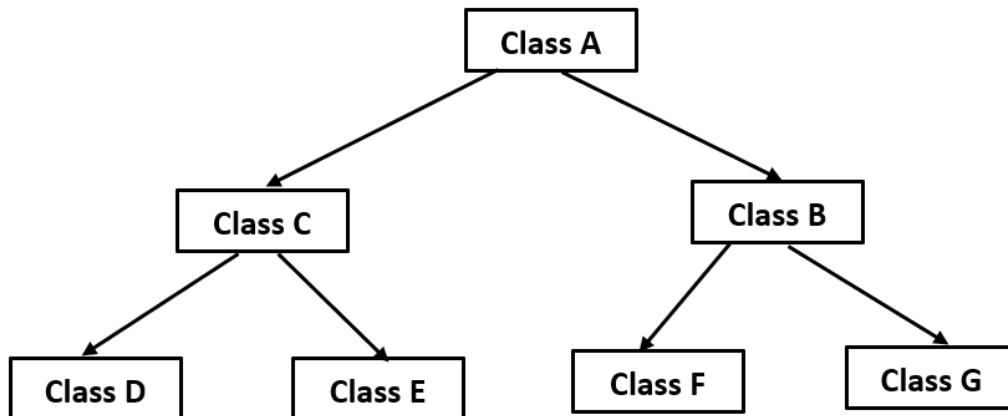


Figure 1.

- i. Multiple Inheritance
- ii. Hybrid Inheritance
- iii. Hierarchical Inheritance
- iv. Multi-Level Inheritance

14. Which feature can be implemented using encapsulation?

- i. Inheritance
- ii. Data Abstraction
- iii. Polymorphism
- iv. Overloading

15. Consider the following code and select the correct output

```
#include<iostream>
using namespace std;
class Vehicle
{
public:
    Vehicle()
    {
        cout << "This is a Vehicle\n";
    }
}
```

```

};

class Fare
{
    public:
    Fare()
    {
        cout << "Fare of Vehicle\n";
    }
};

class Car : public Vehicle
{

};

class Bus : public Vehicle, public Fare
{

};

int main()
{
    Bus obj2;
    return 0;
}

```

- i. This is a Vehicle
- ii. Fare of Vehicle
- iii. This is a Vehicle
Fare of Vehicle
- iv. This is a Vehicle
This is a Vehicle

16. Which of the following statement is incorrect about “Composition”?

- i. Also known as “class composition”
- ii. Process of building complex objects from simple objects
- iii. If the C++ composition is destroyed, then all of its sub-objects will be destroyed
- iv. Depicts the “has-a” relationship

17. Which symbol is used to create multiple inheritance?

- i. Dot
- ii. Comma
- iii. Dollar
- iv. None of the above

18. An array of a class type is also known as

- i. an array of functions
- ii. an array of variables
- iii. an array of methods
- iv. an array of objects

19. Compile time polymorphism can be achieved by

- i. Function overloading
- ii. Virtual functions
- iii. Both function overloading and virtual functions
- iv. None of them

20. Which of the following is not an advantage of composition

- i. Classes are simple and straightforward
- ii. Increase the overall complexity of objects
- iii. One class can perform a specific task
- iv. Class is easier to write and debug

Part B

Answer all questions

Question 01

(a) Briefly describe the following terms.

- i. Procedural Programming
- ii. Object Oriented Programming

[3 x 2 Marks]

(b) State whether the following statements are TRUE or FALSE. If it is false justify your answer.

- i. Constructors are automatically invoked when a class is created.
- ii. “this” keyword is used to points to the calling object.

[3 x 2 Marks]

(c) Create a class named Rectangle that has three data members, length (float), width (float) and color (string).

Your class should have:

- A constructor with default values for length = 10.0, width = 5.0 and color = “blue”.
- A parameterized constructor that initializes the three data members.
- Provide set and get functions for each data member.
- Provide a member function named Cal_Peri that calculates the perimeter of the rectangle.

Show the class declaration only, not the method implementation.

[8 Marks]

Question 02

(a) Compare and contrast Data Abstraction and Encapsulation.

[4 Marks]

(b) State whether the following statements are TRUE or FALSE. If it is false justify your answer.

- i. Data abstraction helps to keep data members and functions safe from outside interference and misuse.
- ii. Composition is used for objects that have an “is-a” relationship with other objects.

[2 x 2 Marks]

(c) Consider the following codes given below.

i. Find the error(s) of the code and explain how to correct it (them).

```
class Measurements {
    public
        int a;
    private
        int b;
};
int main() {
    Measurements meas;
    meas : a = 20;
    meas : b = 30;
    return 0;
}
```

ii. Find the output of the following code.

```
class X
{
    private:
        int d;
    public:
        void set_value(int k)
        {
            d=k;
        }
        void show_sum(int n)
        {
            cout<<"sum of "<<d<<" and "<<n<<" = "<<d+n<<endl;
        }
};
class Y
{
    public:
        X a;
        void print_result()
        {
            a.show_sum(5);
        }
};
int main()
{
    Y b;
    b.a.set_value(20);
    b.a.show_sum(100);
    b.print_result();
}
```

[4 x 2 Marks]

Question 03

(a) Briefly describe the following terms.

i. Base Class

ii. Derived Class

[2 x 2 Marks]

(b) Compare and contrast compile time polymorphism and run time polymorphism

[4 Marks]

(c) A Hospital contains many types of Members including Patients and Employees. Employees consist of Medical Staff and Non-Medical Staff. Medical Staff consists of Doctors, Nurses and Allied-Health Professionals. Non-Medical Staff contains Administrators and Staff. Patients are either Inpatients and Outpatients.

(i) Draw a UML diagram for the Members Class Hierarchy.

[4 Marks]

(ii) Write class headers for each of the above classes.

[4 Marks]

---- END OF THE PAPER ----