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No of MCQs	20
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No. of Pages	10

GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY
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

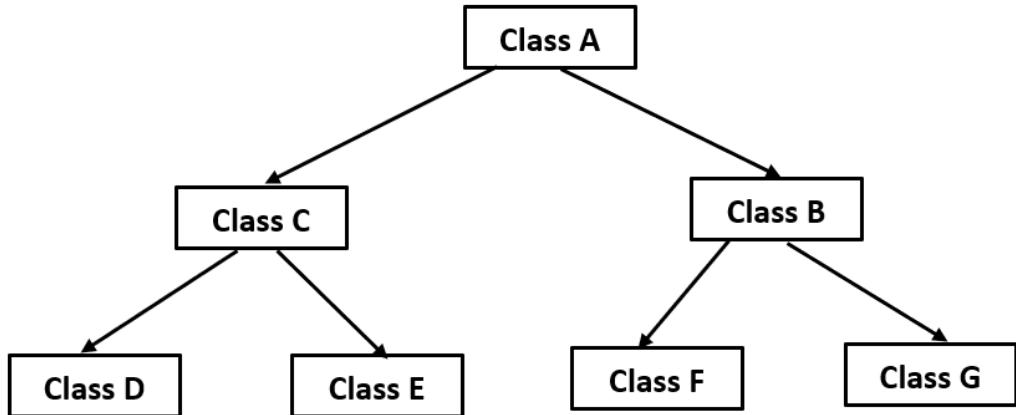


Figure 1.

- 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_Perি 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 ----