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Minor CERTIFICATION EXAMINATION, NOVEMBER 2023

First Semester

18CSC002J - OBJECT ORIENTED DESIGN AND PROGRAMMING

(For the candidates admitted during the academic year (2020-2021 & 2021-20222))

Note:

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

PART - A (20 × 1 = 20 Marks)

Answer **all** Questions

		Marks	BL	CO
1.	The drawbacks of Structured Programming over Object Oriented Programming are (A) Restricted data access, Software Maintenance time Consuming, Separated Data and Functions (B) Restricted data, Easy software Maintenance, Combined Data and Functions (C) Unrestricted data access, Difficult and Time Consuming Software Maintenance, Separated Data and Functions (D) Clearly Defined Functions and interface	1	3	1
2.	Think that you got a call on your mobile, we have an option to either pick it up or just reject it. But in reality, there is a lot of code that runs in the background. What is the concept for this scenario? (A) Abstraction (B) Polymorphism (C) Encapsulation (D) Inheritance	1	4	1

3.	Identify the appropriate missing line for explicit type conversion:
	#include <iostream>
	using namespace std;
	int main( )
	{
	float a=2.5555;
	……..?
	cout<<b;
	return 0;
	}
	(A) int b=(int)a;
	(B) int b=a (int);
	(C) int b=(int)a float;
	(D) int b=(int)a (float);
		1	3	1

4. What is the output of the below program? 1 5 2

```
#include<iostream.h>
class Test
{
int var1,var2;
public:
Test(int A = 100, int B = 200 )
{
var1 = A;
var2 = B;
}
void Display()
{
cout<<var1<<"\t" <<var2<<endl;

}
~Test()
{ };
};
int main()
{
Test object1;
Object1.Display();
return 0;
}
```

(A) 100 200
(B) Run time error
(C) Compile time error
(D) No output

5. Which of the following statement is correct about Constructor and Destructor? 1 3 2
(A) Constructor has the same name as that of the class with void return type.
(B) Constructor does not have the same name but it has void return type.
(C) Constructor has no return type with same name as Class name.
(D) Destructor has the same name as the first member function of the class.

6. How many Destructors are allowed in a Class? 1 3 2
(A) 1
(B) 2
(C) 3
(D) 4

7. Which of the following operator cannot be overloaded? 1 5 2
(A) +
(B) ?:
(C) -
(D) %

8. Behavior Diagram does not include _____ 1 5 2
(A) Use case diagram
(B) Behaviour diagram
(C) Activity diagram
(D) Component diagram

9. In hierarchical inheritance, do members of base class get divided among all of its child classes? 1 3 3
(A) Yes, equally
(B) Yes, depending on type of inheritance
(C) No, it's doesn't get divided
(D) No, it may or may not get divided

10. If _____ inheritance is done continuously, it is similar to tree structure. 1 4 3
(A) Hierarchical
(B) Multiple
(C) Multilevel
(D) Hierarchical and Multiple

11. Which rule will not affect the friend function? 1 2 3

(A) Private and protected members of a class cannot be accessed from outside
(B) Private and protected can be accessed from anywhere
(C) Protected member can be accessed anywhere
(D) Private member can be accessed anywhere

12. Consider the base class "Shape" . The classes"Triangle", "Circle", and "Square" are derived from the base class. Which of the following is incorrect derivation? 1 4 3

(A) class Triangle: public Shape
(B) class Circle: public Shape
(C) class Shape: public Triangle
(D) class Square: public Shape

13. Templates are initiated at_____ 1 2 4

(A) Runtime
(B) Compile time
(C) At the time of Object creation
(D) At the time of Class creation

14. Component Diagrams are considered as? 1 2 4

(A) Behavioural Diagrams
(B) Structure Diagrams
(C) Activity Diagrams
(D) Sequence Diagrams

15. List the 3 essential elements of a deployment diagram. 1 2 4

(A) artifacts, nodes and connections
(B) stack, queue, deque
(C) memory, database, connections
(D) package, element, deployment

16. Which returns the cause of a user defined exception? 1 4 4

(A) what()
(B) try block
(C) catch block
(D) exception class

17. Identify the containers which implements sorted data structures that can be quickly searched with complexity O(log n) 1 1 5

(A) Associative containers
(B) Sequence containers
(C) Unordered associative containers
(D) Container adaptors

18. 1 5 5

```
#include <iostream>
#include <vector>
int main ()
{
int fun[] = {1,5,3,4,2};
std::vector<int> arr;
for (auto i = std::begin(fun); i!=std::end(fun); ++i)
arr.push_back(*i);
for (auto i = std::begin(arr); i!=std::end(arr); ++i)
std::cout << ' ' << *i;
std::cout << '\n';
return 0;
}
```

(A) 1 2 3 4 5
(B) 5 4 3 2 1
(C) 2 4 3 5 1
(D) 1 5 3 4 2

19. Which is among following is used to Open a file for output and move the read/write control to the end of the file? 1 1 5

(A) ios::ate
(B) ios::at
(C) ios::ann
(D) ios::end

20.
```
#include <bits/stdc++.h>
using namespace std;
int main()
{
vector<int> g1;
for (int i = 1; i <= 10; i++)
g1.push_back(i * 10);
cout << "Ref oper[g]:g1[2] = " << g1[2];
cout << "\tfront element = " << g1.front();
cout << "\tback ele = " << g1.back();
int* pos = g1.data();
cout << " first ele =" << *pos;
return 0;
}
```

	1	5	5

(A) Ref oper[g]:g1[2] = 30 front element = 10 back ele= 100 first ele= 10

(B) Ref oper[g]:g1[2] = 20 front element = 20 back ele= 100 first ele= 20

(C) Ref oper[g]:g1[2] = 10 front element = 10 back ele= 100 first ele= 10

(D) Ref oper[g]:g1[2] = 30 front element = 30 back ele= 100 first ele= 30

PART - B (5 × 4 = 20 Marks)

Answer **any 5** Questions

		Marks	BL	CO
21.	Differentiate between Procedural and object oriented programming paradigm	4	4	1
22.	Illustrate the use case model for activities involved in ordering food in a restaurant from the point when the customer enters a restaurant to the point when he leaves the restaurant with neat diagram.	4	1	2
23.	For the program shown below, comment on the output and provide the reason for the output with necessary solution, if any.	4	5	2

```
#include <iostream>;
using namespace std;
class Sample{
public:
Sample(const Sample &amp;amp;obj)
{
  cout<<"Copy Constructor";
}
};
int main(){
Sample obj;
return 0;
}
```

24.	Describe about Hybrid Inheritance with an example.	4	2	3
25.	What are exceptions? List some of common exceptions	4	1	4
26.	For an Online Bike Service Booking system draw the statechart diagram	4	6	4
27.	Discuss about STL iterators with a Small Example	4	6	5

PART - C (5 × 12 = 60 Marks)

Answer **all** Questions

		Marks	BL	CO

28.	(a) Define a C++ class to represent a Student.The attributes are: id, name, number of subjects, marks_per_subject. The number of subjects varies for each student. (Use dynamic memory allocation to store marks_per_subject). Accept data for 'n' students and print the mark list for each student on the screen.	12	6	1
	(OR)			
	(b) (i) Draw the Use Case Diagram for an online shopping example. - 6 Marks (ii) Demonstrate the UML Class diagram with online shopping example. - 6 Marks			
29.	(a) Design a class named Box whose dimensions are integers and private to the class. The dimensions are labelled: length l, breadth b, and height h. The default constructor of the class should initialize l, b, and h to 0. The parameterized constructor Box(int length, intbreadth, int height) should initialize Box's l,b and h to length, breadth and height. The copy constructor Box(Box B) should set l,b and h to B's s l,b and h, respectively. Apart from the above, the class should have 4 functions: int getLength() - Return box's length int getBreadth() - Return box's breadth int getHeight() - Return box's height long long CalculateVolume() - Return the volume of the box Overload operator << for the class Box. If B is an object of class Box: cout<<B should print B.l, B.b and B.h on a single line separated by spaces.	12	6	2
	(OR)			
	(b) Discuss briefly about sequence diagram and draw the sequence diagram for an emotion based music player.			
30.	(a) Create a class with classname as Shape and use the data members as dimension which should be accessed by all members of the class and outside of the class also. Derive a new class as Square which inherits from Shape and calculate the area using the member function calculateArea().Derive a new class as Circle which inherits from the base class Shape and calculate the area using the member function calculateArea().Use Pure virtual function as virtual float calculateArea() = 0 in base class Shape. Calculate the area of Square and rectangle and print the same.	12	6	3
	(OR)			
	(b) Discuss about multiple,Hybrid inheritance with example.			
31.	(a) Design a simple Calculator performing the four basic arithmetic operations in C++ using a class template. The template of the class will consist of two variables whose values are passed at the time of object creation. The constructor of this class takes two arguments of generic datatypes. Further, this Calculator class template consists of five main functions – show(),addition(), subtraction(), multiplication(), and division(). The show() function is responsible for calling the rest of the four generic functions. Created two instances from the template of Calculator class and performed the basic calculations using its class functions	12	3	4
	(OR)			
	(b) Discuss about component and deployment diagrams with examples.			
32.	(a) Explain in detail about file handling in c++ with example program	12	2	5
	(OR)			
	(b) Explain in detail about sequence containers with example.			

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