Reg. No.															

B.Tech/ M.Tech (Integrated) DEGREE EXAMINATION, MAY 2024

First & Second Semester

21CSC101T – OBJECT ORIENTED DESIGN AND PROGRAMMING

(For the candidates admitted from the academic year 2022-2023 onwards)

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: 75

PART – A (20 × 1 = 20Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. Which feature of OODP indicates code reusability? (A) Inheritance (B) Encapsulation (C) Abstraction (D) Polymorphism	1	2	1	2
2. Which of the following access specifier allows the user to inherit the private members of a class? (A) Private (B) Protected (C) Default (D) Public	1	1	1	2
3. What happens if a user forgets to define a constructor inside a class? (A) Objects are not created properly (B) Segmentation fault (C) Error occurs (D) Compiler provides a default constructor to avoid faults/errors	1	2	2	2
4. Which of the following C++ operators can be overloaded? (A) Size operator (size of) (B) Conditional operator (?:) (C) Arithmetic operator (+,–,*,/) (D) Class member access operator	1	2	1	3
5. Which of the following is true about constructors? (A) A class can have more than one constructors (B) They cannot be inherited (C) Their address can be referred (D) Constructors can have return values	1	1	2	3
6. Which of the following keyword is used to overload an operator? (A) overload (B) friend (C) operator (D) over rider	1	3	2	1
7. Which of the following permits function overloading in C++? (A) Type of arguments (B) Number of arguments (C) Number of objects (D) Type and number of arguments	1	1	2	1
8. Dynamic aspects related to a system are shown with help of (A) Sequence diagrams (B) Interaction diagrams (C) Deployment diagrams (D) Use case diagrams	1	2	2	3
9. In multilevel inheritance one class inherits (A) Only from one class (B) More than one class (C) Atleast one class (D) As many classes as required	1	1	3	1

10. How can you make the private members inheritable? 1 1 3 2

(A) By making their visibility mode as public only
(B) By making their visibility mode as private in derived class
(C) By making their visibility mode as protected only
(D) It can be done both by making the visibility mode public or protected

11. Which of the following combines two concurrent activities and re-introduces them to a flow where only one activity can be performed at a time? 1 1 4 3

(A) Joint symbol
(B) Fork symbol
(C) Decision symbol
(D) Note symbol

12. Identify what happens when an attempt is made to instantiate an object of an abstract class 1 2 4 2

(A) Success message
(B) Warning message
(C) Compilation error
(D) Objects gets created

13. What is an abstract class? 1 1 4 1

(A) Class specifically used as a base class with at least one virtual function
(B) Class specifically used as a base class with at least one pure virtual function
(C) Class from which any class is derived
(D) Any class is C++ is an abstract class

14. Which is the correct syntax of defining a pure virtual function? 1 2 4 2

(A) Pure virtual return_type_func ( );
(B) Virtual return_type_func ( ) pure;
(C) Virtual return_type func ( ) = 0;
(D) Virtual return_type func ( );

15. Which among the following best describes member function overriding? 1 2 4 2

(A) Member functions having same name in base and derived classes
(B) Member functions having same name in base class only
(C) Member functions having same name in derived class only
(D) Member functions having same name and different signature inside main function

16. _____ keyword is used before a function in a base class which is to be overridden in derived class. 1 1 4 1

(A) void
(B) static
(C) virtual
(D) friend

17. Once a class template is defined, we can create an object of that class using a specific basic or user-defined data types to replace the generic data types used during 1 2 5 2

(A) Function definition
(B) Object definition
(C) Class definition
(D) Function declaration

18. Which container can have the same key? 1 1 5 1

(A) Map
(B) Multimap
(C) Unordered map
(D) Set

19. What type of access does dequeue and vector provide? 1 2 5 2

(A) Linear access
(B) Random access
(C) Parallel access
(D) Sequence access

20. Choose the correct output for the following code: 1 2 5 2

```
int main ( )
{
 deque <int>d;
 d.push_back (10);
 d.push_back (300);
 d.push_front (20);
 for (int i=0; i<d.size ( ); i++)
{
 cout << d[i] << " ";
}
 return 0;
}
```

(A) 10 20 300 (B) 20 10 300
(C) 100 10 20 (D) Syntax error

PART – B (5 × 8 = 40 Marks) Marks BL CO PO

Answer **ALL** Questions

21. a. Write a C++ program to calculate and display the area of a rectangle. Create a class with two private data members length and breadth and three functions. First function to get the values of length and breadth, second function to calculate the area and third function to display area. Length and breadth should be entered by the user. 8 3 1 2

(OR)

b. Design and illustrate the use case model 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. 8 4 1 3

22. a. Write a C++ program that simulates a bookstore inventory system. Define a class called "Book" with attributes such as title, author and price. Implement a class with constructors, including a default constructor, a parameterized constructor and a copy constructor to initialize book objects and display their information. 8 3 2 3

(OR)

b. Draw and illustrate the sequence and collaboration diagram for the withdrawal scenario in the bank ATM system. The system starts the process by employing a standard procedure for validating the card and account holder. 8 4 2 3

23. a. Define three classes with names shapes, rectangle and circle. Make use of the member functions getdata ( ), printdata ( ) and area ( ), to find the area of circle and rectangle. Whether type of inheritance is hierarchical? Explain with the sample output. 8 3 3 2

(OR)

b. Draw the state chart diagram with three different states for order management system. The customers should be able to book the orders in online order management system. The diagram should have joint pseudo state, self-transition, entry and exit connectors, choice pseudo state etc. 8 3 3 3

24. a. Write a C++ program for implementing the concept of class template. Create the template class myFirstClass. Inside this, cerate a constructor that will initialize 8 3 4 2

the two members num1 and num2 of the class. Find minimum and maximum of that two numbers using different data types arguments such as int, float, double and string concepts using function template concepts.

(OR)

b. Create a integer vector object vect1. Insert 5 elements into the vector [10,20,30,40,50] by calling the appropriate insert function. Using multiple catch block exception handling techniques implement the C++ code for the following exception. 8 3 4 4

(i) Type conversion; illegal values, improper casts
(ii) Bound violations; illegal array indices
(iii) Bad references; null pointers.

Write a complete C++ exception handling code to meet the above cases.

25. a. Write a C++ program for sequence container list using array of integer data type and implement the following methods. Create user defined function PrintList ( ) and display output. 8 3 5 4

(i) Push_front ( )
(ii) insert ( )
(iii) sort ( )
(iv) splice ( )
(v) merge ( )
(vi) POP_back ( )

(OR)

b. Write a C++ program to demonstrate the working of STL and perform the following operations in the STL queue and map. 8 3 5 2

(i) Insert
(ii) Delete
(iii) Display
(iv) Find

PART – C (1 × 15 = 15 Marks)

Answer **ANY ONE** Question

	Marks	BL	CO	PO

26. Define method overloading. Develop a C++ program that utilizes function overloading to calculate the volume of different geometric shapes, such as cubes, cylinders and spheres. Implement the functions with 15 4 2 2

(i) Different number of arguments with same return type
(ii) Same number of arguments with different return types to handle each shapes specific calculations

27. Write a C++ program for the below mentioned inheritance scenario: 15 3 3 2

Create a class named shape with a function that prints "This is a shape". Create another named class "Polygon" inheriting the shape class with the same function that prints "Polygon is a shape". Create two other classes named rectangle and triangle having the same function which prints "Rectangle is a polygon" and "Triangle is a polygon" respectively. Again, make another class named square having the same function which prints "Square is a rectangle".

Now try calling the function by the objects of each of these classes.

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