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**B.Tech/ M.Tech (Integrated) DEGREE EXAMINATION, DECEMBER 2023**  
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 40<sup>th</sup> 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 of the following is not an OOPS concept?	1	2	1	2
(A) Encapsulation				
(B) Polymorphism				
(C) Exception				
(D) Abstraction				
2. Who developed object-oriented programming?	1	2	1	2
(A) Adele Goldberg				
(B) Dennis Ritchie				
(C) Alan Kay				
(D) Andrea Ferro				
3. _____ diagram in UML shows a complete model of a system at a specific time.	1	3	1	3
(A) Object				
(B) Class				
(C) Sequence				
(D) Collaboration				
4. Which features of OOPS derives the class from another class?	1	2	1	2
(A) Inheritance				
(B) Data hiding				
(C) Encapsulation				
(D) Polymorphism				
5. How many time a constructor is called in the life-time of an object?	1	2	2	2
(A) Twice				
(B) Thrice				
(C) Only once				
(D) Depends on the way of creation of object				
6. Sequence diagram is _____ oriented.	1	2	2	2
(A) Class				
(B) Time				
(C) Activity				
(D) Relationship				
7. When a destructor is called?	1	2	2	2
(A) After the end of object life				
(B) Anytime in between objects lifespan				
(C) At end of whole program				
(D) Just before the end of the object life				
8. How many parameters does a default constructor require?	1	2	2	2
(A) 1				
(B) 2				
(C) 0				
(D) 3				

9. Behaviour diagram does not include \_\_\_\_\_.  
 (A) Use case diagrams (B) State diagrams  
 (C) Activity diagrams (D) Component diagrams
10. Which members cannot be accessed in derived class in multiple inheritance?  
 (A) Private members of base (B) Public members of base  
 (C) Protected members of base (D) Constructor of base
11. \_\_\_\_\_ keyword is used before a function in a base class which is to be overridden in derived class?  
 (A) Void (B) Static  
 (C) Virtual (D) Friend
12. In an activity diagram, transitions belong to \_\_\_\_\_.  
 (A) Trigger oriented transitions (B) Self-transitions  
 (C) Internal transitions (D) Completion transitions
13. Function template can accept  
 (A) Any type of parameters (B) Only one parameter  
 (C) Only parameters of the basic type (D) Only parameters of the derived type
14. Which among the following are not the valid notations for package and component diagrams?  
 (A) Notes (B) Box  
 (C) Nodes (D) Extension mechanism
15. Which of the following is used for generic programming?  
 (A) Virtual functions (B) Modules  
 (C) Templates (D) Abstract class
16. \_\_\_\_\_ an ability to automatically resize when appending elements.  
 (A) Array (B) Vector  
 (C) Dynamic array (D) Container
17. State the return type of find method.  
 (A) Iterator (B) Integer  
 (C) Boolean (D) Float
18. How many instance are allowed by map container, while inserting an element?  
 (A) 2 (B) 1  
 (C) 3 (D) Multiple
19. Which container can have the same keys?  
 (A) Map (B) Multimap  
 (C) Unordered map (D) Set
20. What are the containers?  
 (A) Containers store objects and data (B) Containers stores all the algorithms  
 (C) Containers contain overloaded functions (D) Containers contain set of iterators

**PART – B (5 × 8 = 40 Marks)**

Answer ALL Questions

	Marks	BL	CO	PO
21. a.i. List and discuss the characteristics of object oriented programming language.	4	3	1	2
ii. Discuss the different types of access specifier with suitable examples.	4	2	1	2
<b>(OR)</b>				
b.i. Distinguish between aggregation and composition with examples.	4	2	1	2
ii. Create a class named triangle with two data members - 'base' and 'height' and a member function 'area' to calculate the area of the triangle.	4	2	1	2
22. a. Elaborate the sequence diagrams on how a user gets a passport from the passport office.	8	3	2	2
<b>(OR)</b>				
b. A state land registration authority is keeping the track of the native addresses and total area of the flat people across the state. Since total population is high and the area to be monitored is huge, the government decided to develop software as per the details. House name, number, city, state, width, height, number of rooms are the data members and print the details of the house using constructor concepts such as default constructor and parameterized constructor.	8	3	2	2
23. a. Illustrate a C++ program to create a multilevel inheritance of person, employee and teacher classes by explaining differences between public, private and protected inheritances with public, private and protected data.	8	3	3	3
<b>(OR)</b>				
b.i. Demonstrate function overriding with an example.	4	2	3	2
ii. Construct activity diagram for the given scenario using fork and join operation with component explanation. (1) A customer can access menus of restaurant (2) To be able to login into the account (3) Select items to order (4) Make payment for order	4	3	3	3
24. a. Write a program that allows the user to add the elements in two vectors. Swap the vector elements and display using STL vector.	8	3	4	3
<b>(OR)</b>				
b. Write a C++ program containing a possible exception using a try block to throw it and a catch block to handle it properly.	8	3	4	2
25. a. Write a program for sequence container list (array of integer data type) and implement the following methods. Create user defined function print list ( ) and display output. (i) push_front ( )      (ii) insert ( )      (iii) sort ( )      (iv) pop_back ( )				

**(OR)**

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|--|---|---|---|---|
| b. Explain about for_each ( ), transform ( ), merge ( ), search ( ) algorithms with suitable examples. | 8 | 3 | 5 | 2 |
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**PART – C (1 × 15 = 15 Marks)**

Marks    BL    CO    PO

Answer **ANY ONE** Question

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|--|----|---|---|---|
| 26. A university conducts examinations and the results are announced. Prepare a report for the following:<br>(i)      Print the marks in the register number order, semester wise for each department<br>(ii)     Print the arrear list semester wise<br>(iii)    Prepare a rank list for each department<br>Identify the problem statement and design the component for each sequence. Draw UML component diagrams, and explain all notations in component diagram. | 15 | 3 | 4 | 3 |
| 27. Ram and Shiva are working as accountants in a bank. They need to know all the arithmetic operations to verify the accounts. Since they are beginner in mathematics, they found difficulty in doing such arithmetic operations. Help them to check accounts by applying arithmetic operations including add, subtract, multiply and divide using class template.  | 15 | 3 | 4 | 3 |

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