

Roll Number: \_\_\_\_\_

**Thapar Institute of Engineering and Technology, Patiala**

**Computer Science and Engineering Department**

BE (CSBS 3<sup>rd</sup> SEM) End-Sem Test ; Jan 29 2021

UCT-303: Object Oriented Programming

Time: 02 Hours; MM: 50

Name of Faculty: Dr. Rinkle Rani

**Note : Attempt any five questions.**

Q 1. a)	Write a program demonstrating Hierarchical inheritance to calculate square and cube of a number having following components	(7)												
	<table><thead><tr><th>Class name</th><th>Private data member</th><th>Public member function</th></tr></thead><tbody><tr><td>Number</td><td>num</td><td>void getNumber() int returnNumber()</td></tr><tr><td>Square</td><td>-</td><td>int getSquare()</td></tr><tr><td>Cube</td><td>-</td><td>int getCube</td></tr></tbody></table>	Class name	Private data member	Public member function	Number	num	void getNumber() int returnNumber()	Square	-	int getSquare()	Cube	-	int getCube	
Class name	Private data member	Public member function												
Number	num	void getNumber() int returnNumber()												
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b)	What is a destructor? Give example to illustrate its role.	(3)												
Q 2. a)	What are static data members and static member functions? Write a program in C++ to count the number of objects created of a given class using static data member(s) and static member function(s).	(7)												
b)	What do you mean by an abstract class? Discuss its usage with example.	(3)												
Q 3. a)	Assume you are having two classes DM and DB which stores the distance. DM stores distance in meters and centimeters and DB stores in feet and inches. Write a program that can read values for the DM class object and convert to class DB using conversion from one class to another class. Show both the cases when the conversion routine is in source class and in the destination class.	(7)												
b)	Design a macro (using preprocessor directives) to find greater of two numbers.	(3)												
Q 4. a)	Write a program to define a class <b>time</b> having three integer data members hours, minutes and seconds, a member function <b>read()</b> to read the values, member operator function to add time, member function <b>print()</b> to display time in HH:MM:SS format. Write a main function to add two time objects using operator overloading and display the results in HH:MM:SS format.	(7)												
b)	What is a friend function? Explain its importance with an example.	(3)												
Q 5. a)	WAP using array of objects to enter rollno, name and marks of students. Find average marks of the students.	(7)												
b)	Discuss different visibility modes to derive a class for inheritance.	(3)												
Q 6.	Consider a binary file having information for objects of a class inventory (Item-No, Item-Desc, Cost). Write a program to perform following operations on the above existing binary file. (The number of records are not known in advance) (i) Append a new record to the file (ii) Modify the details of a record (iii) Display the contents of the file	(10)												
Q 7. a)	Differentiate between Procedural Programming and Object Oriented Programming.	(4)												
b)	Define constructor. Write main features of a constructor. Explain various types of constructors with suitable examples.	(6)												