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Reg. No. : | | | | | | | | | | |

Question Paper Code: 53204

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Computer Science Engineering

15UCS304 - OBJECT ORIENTED PROGRAMMING WITH C++

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. What is the output of the following code CO1-U

```
char symbol[3]={'a','b','c'};
for (int index=0; index<3; index++)
cout << symbol [index];
```

(a) a b c (b) "abc" (c) abc (d) 'abc'

2. Given a class named *Book*, which of the following is not a valid constructor? CO2-U

(a) Book ( ) { } (b)Book(Book b){ }

(c) Book (Book &b) { } (d)Book(char* author,char* title) { }

3. If a class C is derived from class B, which is derived from class A, all through public inheritance, then a class C member function can access CO3-R

(a) protected and public data only in C and B. (b) protected and public data only in C.

(c) private data in A and B. (d) protected data in A and B.

4. Exception handling is targeted at CO4-R

(a) Run-time error (b) Compile time error (c) Logical error (d) All of the above.

5. To perform stream I/O with disk files in C++, you should CO5-R

(a) open and close files as in procedural languages.
(b) use classes derived from ios.
(c) use C language library functions to read and write data.
(d) include the IOSTREAM.H header file.

PART – B (5 x 3= 15 Marks)

6.	What is the Need for Static Members?	CO1- R	
7.	List any two non overloadable operators and two operators that cannot be overloaded with friend functions.	CO2- R	
8.	What is meant by Abstract Class?	CO3- R	
9.	What happens when a raised exception is not caught by catch block?	CO4- R	
10.	What is a namespace?	CO5- R	

PART – C (5 x 16= 80 Marks)

11.	(a)	(i) Write a C++ program to design a class having static member function named showcount( ) which has the property of displaying the number of objects created of the class.	CO1- App	(7)
		(ii) Electricity board charges the following rates to domestic users, it discourages large consumption of energy: FOR the first 100 units – 60 paise per unit For next 200 units – 80 paise per unit Beyond 300 units – 90 paise per unit. All users are charged a minimum of Rs.50.00. If the total amount is more than Rs.300.00 than an additional surcharge of 15% is added. Write a C++ program to read the names of users and number of units consumed and print out the charges with names.	CO1- App	(9)
		Or		
	(b)	Write short notes on abstraction and encapsulation in c++ with a neat example.	CO1- R	(16)
12.	(a)	(i) Define a class Coord having two members type int as x and y. Use this class to define another class Rectangle which has two members of type Coord as UpperLeftCoord and BottomRightCoord. Define the constructors and member functions to get the length and breadth of rectangle. Write a global function which creates an instance of the class Rectangle and computes the area using the member functions.	CO2- App	(8)
		(ii) What is friend function? Write a C++ program to find out sum of two private data members x and y of two classes A and B using a common friend function. Assume that the prototype for both the classes will be void sum (A, B).	CO2- App	(8)
		Or		

(b) (i) Define a class Date with three variables for day, month and year. CO2- App (8)

a. Write the default and parameterized constructors,

b. Overload the operators <<,>> to read and print Date object,

c. Overload > to compare two dates.

d. Write the destructor that sets values to zero for all three variables. Define object of the class in main and call the above defined functions.

(ii) Define function overloading. Write a C++ program to define three overloaded functions to swap two integers, swap two floats and swap two doubles. CO2- App (8)

13. (a) (i) Write a c++ program that will give the conditions of environment required, food habits and unique characteristics of pet animals fish and dog. Define a base class called pet that describe any common household pet; two derived classes called fish and dog with items specific to that type of animal.. Write pure virtual functions in the base class for operations that are common to both types of animals. Write a program to test the usage of classes. CO3- App (8)

(ii) Write a program to design a class representing the information regarding digital library (books, tape: book & tape should be separate classes having the base class as media). The class should have the functionality for adding new item, issuing, deposit etc., the program should use the runtime polymorphism. CO3- App (8)

Or

(b) (ii) Assume that a bank maintains two kinds of accounts for customers, saving and current. The savings account provides compound interest and withdrawal facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class account that stores customer name, account number and type of account. Inherit the account class into cur_acct and sav_acct. Include the necessary member function and constructors to achieve the following tasks: CO3- App (9)

a) Accept deposit from a customer and update the balance.
b) Display the balance
c) Compute and deposit interest
d) Permit withdrawal and update the balance

e) Check the minimum balance, impose penalty and update the balance

14.	(a)	(i) Write a program to find the minimum value in an array of n elements using function templates. Find the minimum of 5 integers and 10 floating point numbers.	CO4- App	(8)
		(ii) Write a C++ program to implement the exception handling with rethrowing in exception.	CO4- App	(8)
		Or		
	(b)	(i) Write a class template to represent a generic vector. Include member functions to perform the following tasks: a) To create the vector b) To modify the value of the given element c) To multiply the vector by a scalar value d) To display the elements of the vector	CO4 -App	(8)
		(ii) Write a program with the following a. A function to read two double type numbers from the keyboard. b. A function to calculate the division of these two numbers. c. A try block to detect and throw an exception if the condition "divide by zero" occurs. d. Appropriate catch block to handle the exceptions thrown.	CO4- App	(8)
15.	(a)	What are the two methods of opening a file? Explain with examples. What is the difference between the two methods.	CO5- App	(16)
		Or		
	(b)	Write short I/O manipulators with a neat example	CO5- App	(16)