Printed Pages:3
Session: 2022-23

Roll No.:

Course Code: KCS-054
Course Name: Object Oriented System Design
Date of Exam:
Maximum Marks:75

Time:2 hours

Instructions:
1. Attempt All sections.
2. If require any missing data, then choose suitably.

Q. No.	Question	Marks	CO	KL	PI
	Section-A	Total Marks: 5*2 =10			
1	**Attempt ALL Parts**				
a)	Highlight the merits of Jackson structured development methodology.	2	CO3	K2	2.1.1
b)	When is it required to create an abstract class? Explain it with suitable example.	1+1	CO4	K2	2.2.2
c)	"Inline functions are different from Macros." Justify **(Sapient-2012)**	2	CO4	K2	4.3.4
d)	In what order the class constructors are called when a derived class object is created? **(IBM-2015)**	2	CO5	K2	1.4.1
e)	Define constant pointer. What is the usage of pointers in C++?	1+1	CO5	K2	1.3.1
	Section-B	Total Marks: 3*5 = 15			
2	**Attempt ANY ONE part from the following**				
a)	**"Jackson Structured Development aims at developing a maintainable software".** Justify above statement and explain all the phases of JSD.	5	CO3	K2	2.3.1
b)	How can we map object-oriented concepts using non-object-oriented language?	5	CO3	K2	3.1.1
3	**Attempt ANY ONE part from the following**				

a)	Write the Output of:
	 #include <iostream>
	 using namespace std;
	 class A
	 { int id;
	 static int count;
	 public:
	 A() {
	 count++;
	 id = count;
	 cout << "constructor for id " << id << endl; }
	 ~A() {
	 cout << "destructor for id " << id << endl; }};
	 int A::count = 0;
		5	CO4	K3	4.1.3

	``
	int main() {
	A a[3];
	return 0; }
	``
	                    (TCS-2019)				

b)	Write the Output of:
	``c
	#include <stdio.h>
	int main()
	{
	    int i=3;
	    switch(i)
	    {
	        case 0: printf("Purple");
	        break;
	        case 1+1: printf("Blue");
	        break;
	        case 7/2: printf("Yellow");
	        break;
	        case 3%2: printf("Black");
	        break;
	    }
	    return 0;
	}
	``
	                    (TCS-2021)
		5	CO4	K3	4.1.3

4	**Attempt ANY ONE part from the following**				
a)	"A copy constructor is a member function that initializes an object using another object of the same class". Write a program to justify the above statement by implementing copy constructor.	5	CO5	K3	4.3.4
b)	Write a program to explain 'this' pointer in C++.	5	CO5	K3	3.4.2
Section-C		**Total Marks: 5*10 = 50**			
5	**Attempt ANY ONE part from the following**				
a)	Compare SA/SD and Jackson Structured Development? Is JSD methodology Object Oriented? Give proper justification?	5+5	CO3	K4	2.2.4
b)	"After analysis phase, we have the object, dynamic, and functional models but the object model is the main framework around which the design is constructed". Justify it with example?	10	CO3	K4	2.2.5
6	**Attempt ANY ONE part from the following**				
a)	How function overloading is different from overriding. Write a program to overload + operator using friend function to concatenate two strings. **(ServiceNow Inc. -2017)**	5+5	CO4	K3	2.4.3
b)	Differentiate between call by value and call by reference. Write a program to support the explanation	5+5	CO4	K3	2.4.3
7	**Attempt ANY ONE part from the following**				
a)	How virtual functions are used to support "run time polymorphism"? Justify your answer with proper implementation in C++.	5+5	CO4	K3	3.2.1

b)	How can we access a private member of another class within the program? Implement it by writing the code in C++.	5+5	CO4	K3	2.2.5
8	**Attempt ANY ONE part from the following**				
a)	Which technique is used to implement early and late binding in polymorphism? Implement it by writing the code in C++ to support your answer.	5+5	CO5	K3	4.1.1
b)	**"Inheritance is a feature or a process in which, new classes are created from the existing classes".** With reference to the above statement explain the significance of inheritance. Implement the concept of multilevel inheritance with a suitable example.	5+5	CO5	K3	3.4.2
9	**Attempt ANY ONE part from the following**				
a)	Create a class Distance which has data members as: • **Feet** • **Inches** and a member function • **display_Distance** • **add (arg1, arg2) which has two parameters (objects of class Distance)** This function adds the two distances (feet and inches separately). Write the program to take input of two distances and then display the result of addition.	10	CO5	K3	2.4.4
b)	Assume that a bank maintains two kinds of accounts for customers • **Savings account** • **Current account** The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Create a class that stores customer name, account number and type of account. From this derive the classes curr_account and sav_account to make them more specific to the requirements. Include the following member functions: • **accept deposit and update balance** • **display balance** • **compute and deposit the interest** • **permit withdrawal and update balance.**	10	CO5	K3	2.4.4

CO   Course Outcomes mapped with respective question
KL   Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)
      K1- Remember, K2- Understand, K3-Apply, K4- Analyze, K5: Evaluate, K6- Create