



A Constituent Institution of Manipal University

I SEMESTER (M.C.A)

MAKE-UP EXAMINATIONS, JAN 2018

SUBJECT: OBJECT ORIENTED PROGRAMMING & DESIGN

[MCA 4101]

REVISED CREDIT SYSTEM (22/12/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitably assumed.
- 1A. With the help of an example, explain the concept of multi-level inheritance of classes 5
 Base1, Derived1 and Derived2. Class Derived1 inherits publicly from Base whereas
 Derived2 follows protected type of inheritance from Derived1. What do you think
 happens to the public and protected members in such a private inheritance?
- 1B. Draw a UML Class Diagram representing the following elements from the problem domain for a hockey league. A hockey league is made up of at least four hockey teams. Each hockey team is composed of six to twelve players, and one player captains the team. A team has a name and a record. Players have a number and a position. Hockey teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and a number of years of experience, and can coach multiple teams. Coaches and players are people, and people have names and addresses. Draw a class diagram for this information, and be sure to label all associations with appropriate multiplicities.
- **1C.** Describe a union type of variable in C++
- 2A. Write a C++ program to create a file "Stock.dat". Store the following information for 10 items: Item name, Item id, unit price, quantity. Use Stock.dat file to store this information. The program should also allow reading the stored information from the file.
- **2B.** Explain the C++ exception handling mechanism.
- **2C.** List the principles of UML modelling.

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- Differentiate between "passing arguments by reference" and "passing arguments by 5 3A. value". Write a function swap characters() that accepts two single character arguments by reference and then swaps values of the two arguments. Write the main part of the program that calls this function.
- **3B**. Explain the working of while and do-while loop using an example each. 3 2
- **3C**. void my choice()

{

}

{

}

```
char c:
        cout << endl << "Do you like cricket, answer y or n?: ";
        c = ' ':
        while(c!='y' && c!='n') {
               cin >> c;
               if(c!='n' && c!='y')
                       cout << endl << "Invalid reply, try again: ";</pre>
        }
       if(c=='n') {
               cout << endl << "I don't like cricket ";
               my_choice();
        }
       cout << endl << "I like cricket too!";
int main()
        my_choice();
        return 0;
What will the above program print if you answer "n" 3 times?
```

- 4A. Write a C++ program to perform addition and subtraction on two complex numbers (with the form a+bi where a is the real part and b is the imaginary part) with operator overloading using member functions. Example: (2+3i) + (3+4i) = 5+7i. Create a class called complex with two data members: real and imaginary of integer
- type. **4B.** Write a program implementing function template that returns the cube of its argument. 3 The template must accept one argument (type integers and floats).
- Draw a use case diagram for a simple watch. A WatchUser may either consult the time 2 **4C**. on their watch (with the ReadTime use case) or set the time (with the SetTime use case). However, only the WatchRepairPerson actor can change the battery of the watch (with the ChangeBattery use case).

5A.	Explain function overloading in C++ with the help of an example.	5
5B.	Explain the abstract base class. Give an example.	3
5C.	Write a program to read two numbers x and y. Evaluate z given by the equation:	2
	z = x - y. Use exception handling to throw an exception in case a negative result is	
	attempted.	

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