Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.C.A

END SEMESTER EXAMINATIONS, FEBRUARY 2021

SUBJECT: OBJECT ORIENTED PROGRAMMING [MCA 4152]

REVISED CREDIT SYSTEM

(26 /02/2021)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. Consider a class called Book_details which stores the information about a book such as: book id (integer, starting from 1), book title (string), number of copies (integer), price (float). Create the above class with necessary input & output functions and store the objects of this class in a file called 'Book_info.dat'. You need to display the details of a particular book based on the book id entered by the user using the concept of random-access file. Write a complete program to implement the solution to the above problem. **5**

1B. Given the objects of C++ string class as follows: **3**

string str1("**Computer***Applications**") , str2 , str3;

Write statements using the functions of string class library to perform the following operations:

i) Append the string "Master of" at the beginning of str1 and assign the result to str2.

ii) Remove all occurrence of '*' from str2 and store the result in str2.

iii) Replace the substring "Master of" with "Department of" and store the result in str3.

1C. Mention any two advantages of STL vectors over arrays. **2**

2A. Create a class called ***Array_2D*** having a single two-dimensional array as data member. Write a program to perform input and output operations by overloading stream operators >> and <<. Ensure that the 2D array dimensions are accepted from the user as well. **5**

2B. Assume that a message needs to be encrypted before sending it to the receiver. The message encryption can be done by adding some numeric value 'k' to the ASCII value of individual character of the given string. Similarly, decryption is done by subtracting the ASCII value of individual character by a numeric value 'k'. Create two functions to perform the encryption and decryption operations, and invoke these functions with the help of a function pointer. **3**

2C. Differentiate between an *inline function* and a normal function (Include syntax and example). **2**

3A. i) Illustrate the concept of default, parameterized and copy constructors with an example each. **5**

ii) Can destructors be overloaded? Justify.

3B. Consider a class called CoordinatePoints with x-coordinate and y-coordinate as its data members. Assume that the points belonging to the first quadrant (x>0, y>0) only should be accepted to perform some operation. Create an exception class to handle the above user-defined exception. **3**

3C. Given two objects of ofstream and ifstream classes, namely, op_file and ip_file respectively. Write statements to perform the following operations: **2**

i) To move the get pointer by 4 bytes in the backward direction from the current position.

ii) To move the put pointer to the end of the file.

4A. Explain the ambiguity that arises in multiple inheritance. Elucidate on the two strategies to solve this condition with an example each. **5**

4B. Write a template function that returns the minimum of all the elements of an array. The arguments to the function should be the array name and the size of the array (type int). In main(), test the function with arrays of type int, float, double, and char. **3**

4C. Explain the importance of *virtual destructor* with a suitable example. **2**

5A. Solve the problem of currency conversion from US Dollars to Indian Rupees. Use class to class conversion with routine in destination. **5**

Assume: 1 USD = 73.04 ₹ is the current exchange rate

Sample output: Enter currency in USD: 75.60

Equivalent currency in INR: 5521.94

5B. Implement a program that replicates string concatenation function strcat() by creating a user-defined function *my_strcat()* using pointers. **3**

5C. Differentiate between structure and union. **2**

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