Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

II SEMESTER B.TECH. (COMMON FOR ALL BRANCHES)

END SEMESTER MAKE-UP EXAMINATIONS, JUNE 2017

SUBJECT: PROBLEM SOLVING USING COMPUTERS [CSE 1001]

REVISED CREDIT SYSTEM

22-06-2017

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain in brief the memory unit and central processing unit of a computer system along with their functions. **03**

1B. Write and draw the algorithm and flowchart to check whether the given number is perfect or not. [Note: Perfect number is the sum of all positive divisors of a number excluding the number is equal to the given number Eg. 1+2+3 = 6]. **04**

1C. What is operator precedence and associativity? Show the evaluation of the following expression by clearly showing all the intermediate steps.
(-10 * (2 – 3) / 15 % (5 + 7) +8 * 6 / 12). **03**

2A. Define control structure. What are the three different approaches of control structures that are used to order the execution of program statements? Explain each with an example. **04**

2B. Write a C++ program to input positive numbers and find the average of positive numbers entered by the user. If the user inputs negative number, then stop getting input from the user and find only the average of inputted positive numbers (excluding negative input). **03**

2C. Illustrate the syntax and working of conditional operator (ternary operator). Write a C++ program to find the smallest of 3 numbers using conditional operator. **03**

3A. Illustrate how to find the position of an element to be inserted into a sorted array a [ ] = {1, 2, 3, 5, 6}. Assume the element to be inserted is 4.Show how elements are displayed after inserting the new element into an array. **03**

3B. Write a C++ program to read a matrix of size MxN. Display the matrix after replacing all the prime numbers in the given matrix with the digit 0. [Note: 1 is neither prime nor composite] **04**

3C. Explain the syntax and the usage of string handling function **strcpy( )**.Write an equivalent C++ code to copy the content of one string variable to another string variable without using built in string handling function. **03**

4A. Explain the concept of function returning multiple values using alias and pointers method with the example of function returning sum and difference of two numbers. **03**

4B. Write a C++ program using 1D array to read 4 integer numbers. Call a function **avg_large_two( )** which takes array and number of elements as parameters and return a floating point value. Use bubble sort to sort the given numbers and find the largest 2 numbers from the array. Find the average of the largest two numbers and return the average to the calling function. **04**

4C. What is static variable? Write a C++ program to find the sum of the digits of a given number using recursion and show the usage of static variable in that. **03**

5A. Write a C++ program to enter the details of 3 students name, reg_no and cgpa. Use array of structures and pointers to display the details of the student with highest cgpa. **03**

5B. Write a C++ program to display the name, rollno and total marks of '*n*' subjects of a student using object oriented programming concept. The member functions **get_stud_det( )** should get the name and rollno of a student, **get_total( )** should get the marks of '*n*' subjects and find the total and **put_stud_det( )** should display name, rollno and total marks of a student. **03**

5C. Discuss on different areas where computers are used to commit crimes with suitable example. **04**