

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: MCA
BRANCH: MCA**

**SEMESTER: II
SESSION: SP/19**

SUBJECT: CA459 OBJECT ORIENTED DESIGN AND PROGRAMMING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
-

- Q.1(a) With reference to OOP what do you understand by Encapsulation and Polymorphism? [5]
- Q.1(b) In C++ what are by mixed mode expressions? How does the compiler decide the data type of the result of a mixed mode expression? [5]
- Q.2(a) What do you understand by operator precedence? Using the standard precedence rules parenthesize the following expressions: [5]
A) $P == Q \ \&\&\ R$
B) $-5 < 9 == P \ \&\&\ 3 == 17$
- Q.2(b) Write a program that accepts text input from the keyboard and counts the average length of the words input by the user. You can assume the user signifies the end of input by pressing Ctrl+Z. [5]
- Q.3(a) In C++ what do you understand by overloaded functions and default parameter values in functions. Demonstrate with examples. [5]
- Q.3(b) Write a function in C++ which correctly receives an integer array of some known size and finds the smallest value in the array recursively. [5]
- Q.4(a) With reference to design of classes, what do you understand by a copy constructor and access control? [5]
- Q.4(b) Design a class to represent a two-dimensional matrix of Integers. The class constructor should specify the size of the matrix which should initially be initiated with zeros after allocation of requisite amount of memory. Write appropriate mutators and Inspectors to set/get elements from the (i, j)th location of the matrix. Overload the extraction operator to provide for a suitable display for the matrix. [5]
- Q.5(a) What are pure virtual functions and abstract classes in C++? Provide an example to illustrate your answer. [5]
- Q.5(b) Write a function template to sort an array of objects (both primitive and user defined) using Selection Sort. [5]

:::29/04/2019 M:::