

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA– SEMESTER –I EXAMINATION –SUMMER-2019

Subject Code:3610003

Date: 18/05/2019

Subject Name: Program Design Techniques

Time:02.30 pm to 05.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Explain the following terms:
- 1) Pseudo-random numbers 01
 - 2) Sorting 02
 - 3) Exchange of two variables 02
 - 4) Algorithm Complexity 02
- (b)** Answer the following: 07
- 1) How can array elements be accessed?
 - 2) Devise an algorithm to find the occurrence of a given number in an array.
- Q.2 (a)** How can you break a problem into sub problems? Explain with example. 07
- (b)** Design an algorithm that counts the number of non-negatives and negatives in a given set of numbers. 07
- OR**
- (b)** Design an algorithm to convert binary number to decimal. 07
- Q.3 (a)** Write a brief account on efficiency of algorithms. Support your answer with appropriate example. 07
- (b)** Given a number n, devise an algorithm to compute its square root. 07
- OR**
- Q.3 (a)** Write an algorithm to compute sine function 07
- $\sin(x) = x/1! - x^3/3! + x^5/5! + \dots + x^n/n!$, where n is accepted as an input.
- (b)** Develop an algorithm that accepts a positive number and then reverse the number. For example, Input is 5679, expected Output is 9765 07
- Q.4 (a)** Develop an algorithm to compute summation of a set of numbers. 07
- (b)** Differentiate between the top-down and bottom-up design. 07
- OR**
- Q.4 (a)** What do you understand by program verification? Discuss any three ways by which you can verify your program. 07
- (b)** Design and implement hash searching algorithm. 07
- Q.5 (a)** Design an algorithm to find the minimum number in a set and its' position where it first occurs. 07
- (b)** Write an algorithm to find the greatest common divisor of two integers. 07
- OR**
- Q.5 (a)** What is binary search? Explain the strategy for binary search algorithm. 07
- (b)** Devise an algorithm to generate and print Fibonacci series where last number of the series is given as an input. 07
