**Question Paper** 



MANIPAL UNIVERSITY

## SCHOOL OF INFORMATION SCIENCES (SOIS) FIRST SEMESTER MASTER OF ENGINEERING - ME (Big Data and Data Analytics) DEGREE EXAMINATION - APRIL 2017 Thursday, 20,2017 Time :10:00AM- 1:00PM

## Algorithms and Data Structures for Big Data [BDA 601] Marks: 100 Duration: 180 mins.

## Answer all the questions.

1)	Explain space and time complexity. Illustrate <sup>(10)</sup> with example.
2)	Design Stack data structure using python. It (10) should be of infinite size. It should have methods to push, pop and peek the stack. Write test cases to check the behavior of stack.
3)	Define Queue data structure. List applications <sup>(10)</sup> of queue. Design queue data structure using python.
4)	Design Single linked list using python. Provide <sup>(10)</sup> methods to delete from tail, and count number of elements in the list. Write test cases to check the behaviors.
5)	Implement quick sort and discus the time <sup>(10)</sup> complexity.
6)	Given a list 25 65 45 15 38 72 81 5 build <sup>(10)</sup> maximum heap. Draw all the stages of building heap. Sort the given list in ascending order. Show all steps.
7)	For the given list 50, 90, 35, 24, 63, 42, 73, 84, <sup>(10)</sup> 48, 55, 12 build BST and provide the in-order, pre-order and post-order traversals. Write methods for BST traversals.
8)	Write short notes on Bit representation as a <sup>(10)</sup>

integer, Polynomial Hash codes and Cyclic-shift hash code.

- <sup>9)</sup> Write BFS method for a given graph. Provide <sup>(10)</sup> an example for BFS traversal.
- <sup>10)</sup> Implement Knuth-Morris-Pratt pattern matching<sup>(10)</sup> algorithm.