

Total No. of Questions—8]

[Total No. of Printed Pages—3

Seat No.	
-------------	--

[5352]-563

S.E. (Computer Engineering) (I Sem.) EXAMINATION, 2018

DATA STRUCTURE & ALGORITHMS

(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :— (i) Attempt Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4,
Q. No. 5 or Q. No. 6, Q. No. 7 or Q. No. 8.

(ii) Draw neat diagrams wherever necessary.

(iii) Assume suitable data, if necessary.

1. (a) Define and explain the following terms : [3]

(i) Data

(ii) Data structure

(iii) Algorithm.

(b) Give pseudo C/C++ code to reverse the string. [3]

(c) Explain the divide and conquer strategy with suitable example.

Comment on its time complexity. [6]

Or

2. (a) Define and explain the following terms : [4]

(i) Sequential organization

(ii) Linear data structure

(iii) Ordered list

(iv) Sparse matrix.

P.T.O.

- (b) Explain polynomial representation using an array with suitable example. [2]
- (c) Explain the Asymptotic notation Big O, Omega and Theta with suitable example. [6]
3. (a) Write a pseudo C/C++ code to insert node into a singly linked list. [3]
- (b) Explain Generalised linked list with suitable example. [3]
- (c) Explain evaluation of postfix expression using stack with suitable example. [6]

Or

4. (a) Give pseudo C/C++ code to implement the following operations on linked stack : [4]
- (i) Create
- (ii) Push data.
- (b) Explain the stepwise conversion using stack for the given infix expression to the postfix expression : [2]
- $$A * B + C * D.$$
- (c) Write pseudo C/C++ code for polynomial addition using singly linked list. [6]
5. (a) Define the following terms with example : [6]
- (i) Linear queue
- (ii) Circular queue
- (iii) Priority queue.

(b) Write pseudo C/C++ code to implement priority queue operations. [7]

Or

6. (a) Explain linear queue and circular queue with suitable example. Give the advantages of circular queue over linear queue. [6]

(b) Write pseudo C/C++ code to implement linked queue. [7]

7. (a) Sort the following numbers using insertion sort :

55, 85, 45, 11, 34, 05, 89, 99, 67.

Discuss its time complexity and space complexity. [6]

(b) Explain sequential search and binary search with appropriate example. Comment on their data organization, time complexity and space complexity. [7]

Or

8. (a) Explain Merge sort using the following example :

18, 13, 12, 22, 15, 24, 10, 16, 19, 14, 30.

Discuss its time and space complexity. [6]

(b) Write a pseudo C/C++ code to sort the data using bucket sort in ascending order. [7]