

- (h) Why bubble sort is so called? 2
- (i) What is the principle on which the quick sort works? 2
- (j) What is a Sparse matrix? 2

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11260/M**D-32/2056****DATA STRUCTURE**

Paper-125

Semester-II (Syllabus May, 2014)

Time Allowed : 3 Hours] [Maximum Marks : 80

Note : Attempt any **two** questions from each of the Sections A and B. Section C is compulsory.

SECTION—A

1. (a) What do you mean by Circular queue? How insertion and deletion are performed on circular queue? Write algorithm and give example. 8
- (b) Define Stack. What operations are performed on a Stack? Write applications of a stack. 7
2. (a) Write an algorithm to reverse the entered sequence of an array without using another array. Discuss with example. 8
- (b) Give array based implementation of the Circular queue. 7

3. (a) What is a Queue? Write algorithm, how you can insert and delete an element from a queue. Write its applications also. 10

(b) Convert the following infix expression into the postfix expression using stack as an Intermediate structure :

$a + (b * c - (x / y \uparrow z) * p) * q.$ 5

4. How you can evaluate a given postfix expression using stack as an intermediate structure? Write algorithm and apply to the following example :

19, 2.14, +, 4.5, 2, 4.3, /, -, 15

SECTION—B

5. (a) Write algorithm for merge sort and discuss the same with the help of an example. 10

(b) Compare linear and binary search with suitable examples. 5

6. (a) Write an algorithm for Bubble sort and apply the same on the following sequence of elements:

12 6 4 9 14 3 7 9

(b) Compare various sorting algorithms. 6

7. (a) Explain searching in a singly linked list. 7½

(b) What is a doubly link list? How insertion and deletion is made in doubly link list? 7½

8. Explain insertion, deletion and search operations in a binary search trees. 15

SECTION—C

9. (a) What is a Stack? Write application of stack. 2

(b) Differentiate between array and link list. 2

(c) What are linear and non-linear data structures? 2

(d) How the average and worst case analysis of an algorithm is performed? 2

(e) What are multi-linked data structures? Give examples. 2

(f) How you can insert a new node into an existing binary tree? 2

(g) Discuss tree traversals. 2

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Total No. of Pages : 2

PC 10615-M**D-25/2056****DATA STRUCTURE—124****Semester—II**

Time Allowed : Three Hours]

[Maximum Marks : 75

Note :- Attempt *two* questions each from Section A and B. Section C is compulsory. All questions carry equal marks.

SECTION—A

1. Define Data Structures. What is the difference between linear and non-linear data structures ? What are the operations that can be performed on data structures ?
2. What is an array ? How arrays are represented in memory ? What is the difference between row major and column major orders ?
3. What are stacks ? How stacks are represented in memory ? Write procedures for PUSH and POP operations.
4. What is a Queue ? How is a queue different from a stack ? Discuss the various operations on queues.

SECTION—B

5. Write a program to create a linked list of names in such a way that after every insertion the list is always in sorted order.

6. What is a Binary Tree ? Discuss the binary tree traversal with suitable examples.
7. What are the various methods of searching ? Discuss and differentiate between them.
8. Elaborate the working of Merge sort algorithm with an example.

SECTION—C

9. Write short notes on the following :

- (a) Algorithmic complexity
- (b) Two-dimensional arrays
- (c) Dynamic data structure
- (d) Binary search trees
- (e) Bubble sort.