Total No. of Questions—**8**] [Total No. of Printed Pages—**2**

Seat No.	

[5352]-568

S.E. (Computer Engineering) (II Sem.) EXAMINATION, 2018
ADVANCED DATA STRUCTURES
(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Answer to the questions (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*) Assume suitable data, if necessary.
(*iii*) Draw neat labelled diagram wherever necessary.
(*iv*) Figures to the right indicate full marks.

Q. 1

a. Write an algorithm to delete node from BST. **[6]**

b. Write an algorithm for Preorder traversal of binary tree and give suitable example. **[6]**

OR

Q. 2

a. Draw any directed graph with minimum 6 nodes and represent graph using adjacency matrix, adjacency list, adjacency multilist and inverse adjacency list. **[6]**

b. Consider the graph represented by following adjacency matrix –

	1	2	3	4	5	6
1	0	3	1	6	0	0
2	3	0	5	0	3	0
3	1	5	0	5	6	4
4	6	0	5	0	0	2
5	0	3	6	0	0	6
6	0	0	2	2	6	0

And find minimum spanning tree of this graph using Prim's algorithm **[6]**

Q. 3

a. Construct hash table of size 10 using linear probing without replacement strategy for collision resolution. The hash function is h (x) = x % 10. Consider slot per bucket is 1.

31, 3, 4, 21, 61, 6, 71, 8, 9, 25 **[6]**

b. Explain about a skip list with an example. Give applications of skip list **[6]**

P.T.O.

OR

Q. 4

a. Construct the AVL tree for the following data by inserting each of the following data item one at a time

10, 20, 15, 12, 25, 30, 14, 22, 35, 40 **[6]**

b Explain following-

i. Static and dynamic tree tables with suitable example. **[3]**

ii. Dynamic programming with principle of optimality. **[3]**

Q.5

a. Write an algorithm to arrange numbers in ascending order using heapsort. Arrange the following numbers in ascending order using heapsort :

48, 0, –1, 82, 10, 2, 100 **[7]**

b. Construct B+ tree of order 3 for the following data:

1,42,28,21,31,10,17,7,31,25,20,18 **[7]**

OR

Q. 6

a. Build the min-heap for the following data:

25, 12,27,30,5,10,17,29,40,35

After creation of min-heap perform one delete operation on it and show the final min-heap **[8]**

b. Write short note on: **[6]**

i. Red-black tree

ii. K-dimensional tree

Q. 7

a. Explain Linked organization of a file **[6]**

b. Define sequential file organization. Explain advantages of indexing over sequential file. **[6]**

OR

Q. 8

a. Define sequential file organization. Write pseudo code for insertion of records in sequential file **[6]**

b. Explain any two types of indices. **[6]**