Total No. of Questions—8]   [Total No. of Printed Pages—4

Seat
No.

[5252]-178

S.E. (I.T.)(Second Semester) EXAMINATION, 2017

DATA STRUCTURES AND FILES

(2012 PATTERN)

Time : Two Hours   Maximum Marks : 50

N.B. :— (i) Answer *four* questions.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right side indicate full marks.

(iv) Assume suitable data if necessary.

1. (a) Clearly indicate the contents of stack during conversion of given infix expression to postfix expression. Consider ^ as exponent operator.   [6]

A* (B-C)/E^F+G

(b) Write a note on priority queue.   [4]

(c) Explain the concept of double enced queue.   [2]

Or

2. (a) Implement Stack as an ADT using sequential orgnization.[6]

(b) Consider the following Circular Multiqueue of integers and Size 6.   [6]

0 1 2 3 4 5

Front of Q1 = −1 Rear of Q1 = −1 Q1 starts at 0
Front of Q2 = −1 Rear of Q2 = −1 Q2 starts at 3
Show the Circular queue conents as per the following operations
    at every step.

(*i*)   Insert 21 in Q1

(*ii*)   Insert 23 in Q1

(*iii*) Insert 9 in Q2

(*iv*) Insert 8 in Q1

(*v*)   Insert 10 in Q2

(*vi*) Insert 11 in Q2

(*vii*) Delete Q1

(*viii*) Insert 81 in Q2

(*ix*) Delet Q1

(*x*)   Insert 25 in Q2

(*xi*) Insert 100 in Q1

(*xii*) Delete Q2

3.   (*a*)   Write an algorithm for the inorder traversal of a Threaded
           Binary Tree.   [6]

      (*b*)   Write the pseudo code for Kruskal's algorithm and find
           Minimum spanning tree for the following graph :   [6]
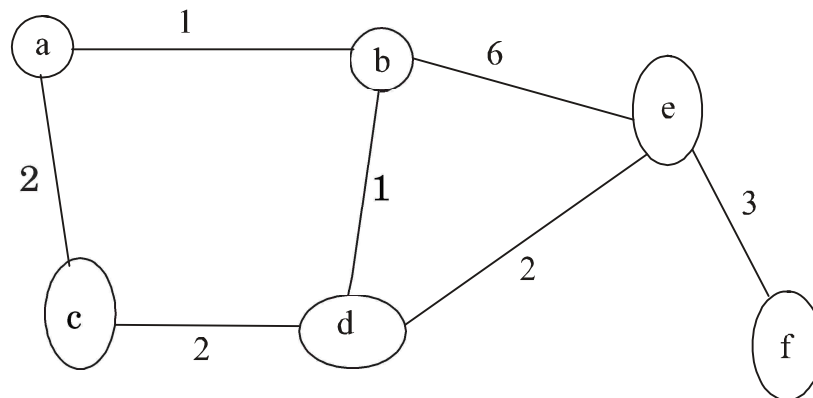
Or

4. (*a*) Write an algorithm for the evaluation of an expression in the expression tree. [4]

(*b*) Explain with example why infix expression is called unpolished expression ? [2]

(*c*) Write an algorithm for BFS of a graph using adjacency matrix. [6]

5. (*a*) How many binary search trees (BSTs) can be constructed for the given 'n' identifiers ? Construct all possible BSTs for the following identifier set. Compute the cost of each BST. Which BST is an Optimal Binary Search Tree ? [10]

The identifier set a[] = (a1,a2,a3) = (do, if, while) with the successful and unsuccessful probabilities.
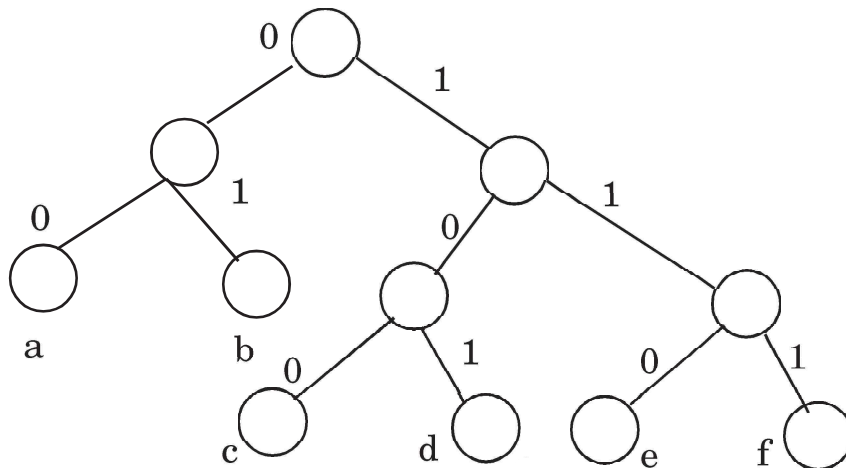
P[]=(0.5, 0.1, 0.05)
Q[]= (0.15, 0.1, 0.05, 0.05)

(*b*) Explain the need of rehashing with example. [4]

Or

6. (*a*) Construct an AVL for the following data set [10]
30, 5, 3, 18, 19, 4, 6, 35, 33, 15

(*b*) Huffman Encoding and Decoding. [4]

Encode : (*i*) addef (*ii*) deaf

Decode : (*i*) 0010000111 (*ii*) 11100101110

7. (*a*) Write the pseudo code for Search and Insert operations in
           Indexed Sequential File.   [6]

    (*b*) Compare Binary file with Text File.   [6]

                              Or

8. (*a*) What is File ? Explain different types of file organizations.
                                                                       [6]

    (*b*) Explain :   [6]

           (*i*)   Primary index

           (*ii*) Secondary index

           (*iii*) Cluster index.