Total No. of Questions—**8**] [Total No. of Printed Pages—**5**

Seat No.	

[5057]-265

S.E. (I.T.) (Second Semester) EXAMINATION, 2016

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 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

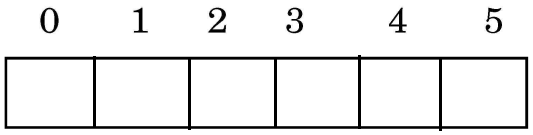
(*b*) Explain the concept of multiqueue, Double Ended Queue and Priority queue. [6]

Or

2. (*a*) Implement stack as an ADT using sequential organization. [6]

P.T.O.

(*b*) Consider the following circular multiqueue of integers and size 6. [6]



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 contents 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*) Delete Q1

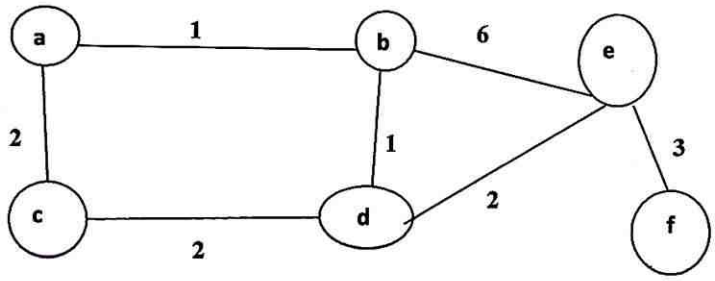
(*x*) Insert 25 in Q2

(*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

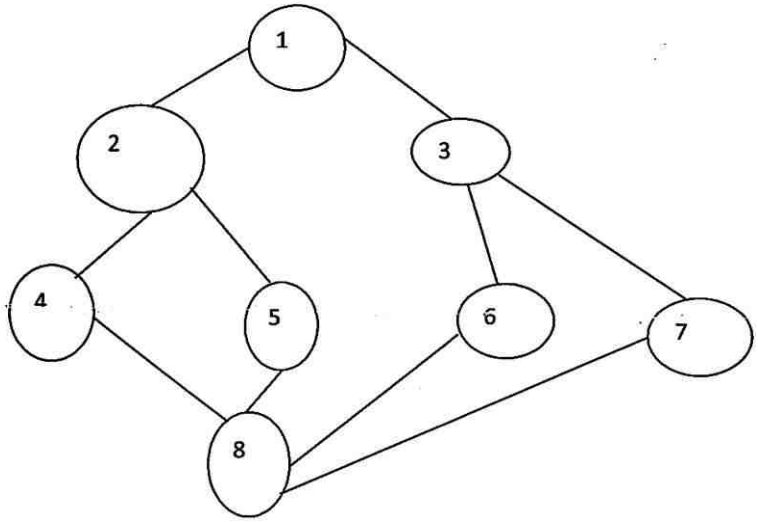
4. (*a*) Construct binary tree using tree traversals : [4]

Inorder : H, D, I, B, E, A, J, F, K, C, G

Postorder : H, I, D, E, B, J, K, F, G, C, A,

(*b*) Explain with topological sorting using example. [4]

(*c*) Give a graph, perform DFS and BFS. Assume starting vertex 1. [4]



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 ? The identifier set a[ ]=(a1, a2 a3) = do, if, while) with the successful and unsuccessful probabilities. [10]

P[ ] = (0.5, 0.1, 0.05)

Q[ ] = (0.15, 0.1, 0.05, 0.05)

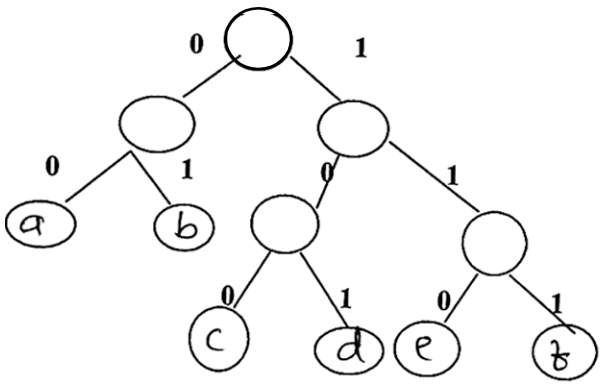
(*b*) Write a note on rehashing. [4]

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.