Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[5252]-578

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

DATA STRUCTURES AND FILES

(2015 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*) Convert the following infix expressions to postfix expression using stack : [6]

((A+B)*C–(D–E) ^ (F+G))

(*b*) Write a non-recursive algorithm to find the post-order traversal of a binary tree. [6]

Or

2. (*a*) Imagine that the content of queue Q1 & Queue Q2 are as shown. What would be the content of Q3 after the following code is executed ? Show pictorial representation of both Q1 & Q2 with value of front & rear. The queue contents are shown front (left) to rear (right). [6]

Q1 : 42 30 41 30 19 20 25 14 10 11 12 15

Q2 : 3 5 7 4 13

1. Q3 = createQueue()

P.T.O.

2. count = 0

3. loop (not empty Q1 and not empty Q2)

3.1. count = count + 1

3.2. dequeue(Q1, x)

3.3. dequeue(Q2, y)

3.4 if (y equal count)

3.4.1. enqueue(Q3, x)

3.5. end if

4. end loop.

(*b*) Draw the BST for the following given nodes and write recursive algorithm for the following operations on it 45, 7, 21, 76, 1, 54, 22, 4, 86 :

(*i*) To search a data,

(*ii*) Height of a tree. [6]

3. (*a*) What is graph ? Explain Graph representations with example. [6]

(*b*) Construct the Huffman tree for the following data : [6]

Data	**Frequency**
P	18
Q	8
R	15
S	2
T	25
U	13
V	5
W	26

Or

4. (*a*) Sort the given list of elements using heap sort :

14, 12, 9, 8, 7, 10, 18 [8]

(*b*) Using the modulo-division method and linear probing without replacement, store the keys shown below in an array with 19 elements. How many collisions occurred :

224562, 137456, 214562, 140145, 214576, 162145, 144467, 199645, 234534. [4]

5. (*a*) Explain threaded binary tree with example. [4]

(*b*) Construct an AVL for the following data :

MAR, MAY, NOV, AUG, APR, JAN, DEC, JUN, FEB, JUL, OCT, SEP.

Show the balance factor of each node and rotation. [10]

Or

6. (*a*) Construct red black tree for given list of numbers :

2, 1, 4, 5, 9, 3, 6, 7. [8]

(*b*) Write a short note on B Tree and Splay Tree. [6]

7. (*a*) Write C++ program to copy one file content into another file. [4]

(*b*) Explain Primitive operations on Index Sequential Files in detail. [8]

Or

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

(*b*) Write C++ pseudo code for modify and delete operation on sequential files. [6]