

Total No. of Questions—8]

[Total No. of Printed Pages—3

Seat No.	
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[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]

$((A+B)*C-(D-E) \wedge (F+G))$

- (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.

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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.

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(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]