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

Seat No.	

[5352]-578

S.E. (I.T.) (Second Semester) EXAMINATION, 2018

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*) Write a C++ function to convert infix expression to postfix expression. [6]

(*b*) Construct a binary tree from the given traversal : [6]

(*i*) Preorder : * + a – b c / – d e – + f g h

Inorder : a + b – c * d – e / f + g – h

(*ii*) Inorder : H, D, I, B, E, A, J, F, K, C, G

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

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]

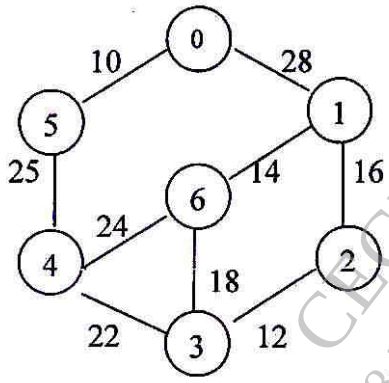
Q1 : 42 30 41 30 19 20 25 14 10 11 12 15

Q2 : 3 5 7 4 13

1. Q3 = createQueue( )
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*) Explain binary search tree in detail. [6]

3. (*a*) Write the pseudo code for Kruskal's algorithm and find minimum spanning tree for the following graph : [6]



(*b*) Create a Huffman's tree for the given data set and find the corresponding Huffman's code : [6]

Data	Frequency
A	10
B	3
C	4
D	15
E	2
F	4
G	2
H	3

Or

4. (*a*) Show stepwise construction of maxheap for the data : [8]

40, 50, 10, 60, 20, 30, 70

(*b*) What is symbol table ? Give symbol table ADT. [4]

5. (*a*) Explain topological sorting using 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 type of rotation. [10]

Or

6. (*a*) Explain red and black tree in detail. [6]

(*b*) Explain the steps to build a B-tree of order 5 for the following data : [8]

78, 21, 14, 11, 97, 85, 74, 63, 45, 42, 57, 20, 16, 19, 32, 30, 31

7. (*a*) Write C++ program for reading the character from keyboard and write in text file. [4]

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

Or

8. (*a*) What is file ? Explain different file opening mode. [6]

(*b*) Explain with example : [6]

(*i*) seekg( )

(*ii*) tellg( )

(*iii*) rewind( ).