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[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

P.T.O.

& Q2 with value of front & rear The queue contents are shown front (left) to rear (right). [6]

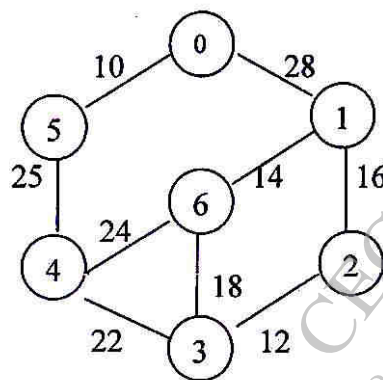
Q1 : 42 30 41 30 19 20 25 14 10 11 12 15

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( ).