SE Sem III (DSE) (C Scheme R-2019) "Computer" Feb 2023

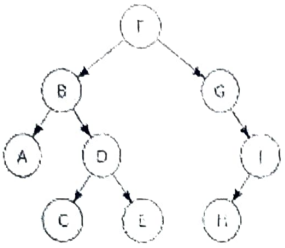
7/2/2023

D.S.E

(3 Hours) **Total Marks: 80**

N.B: (1) Question No. 1 is compulsory
(2) Attempt any three questions out of the remaining five questions

Q.1 (a) Define ADT. Write ADT for Queue data structure. **[05]**
(b) Find the in-order, pre-order, post-order traversal **[05]**

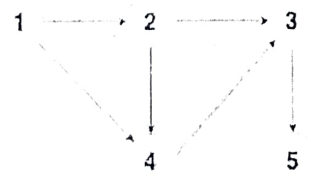


(c) Differentiate between Linked list and Array **[05]**
(d) Explain application of Binary tree **[05]**

Q.2 (a) Apply Huffman coding for following examples. Determine the code for the following characters. "CONSTRUCTION" **[10]**
(b) Consider a hash table with size = 10. Using Linear probing, insert the keys **[10]**
28, 55, 71, 67, 11, 10, 90, 44 into the table.

Q.3 (a) Write an C program to check the well-formedness of parenthesis in an algebraic expression using the Stack data structure. **[10]**
(b) Construct AVL for the given elements 27,25,23,29,35,33,34 **[10]**

Q.4 (a) Write a program to perform the following operations on the Doubly linked list: **[10]**
i. Insert a node at the end
ii. Delete a node from the beginning
iii. Search for a given element in the list
iv. Display the list
(b) Write DFS algorithm. Show DFS traversal for the following graph with all the steps. **[10]**



Q.5 (a) Define Data Structure. Explain its type with an example [10]

(c) Explain B tree. Draw the B-tree of order 3 created by inserting the following data arriving in sequence: 50, 25, 10, 5, 7, 3, 30, 20, 8, 15 [10]

Q.6 (a) Draw the Stack structure in each case when the following operations are performed on an empty stack. [10]

i. PUSH A, B, C, D, E, F
ii. POP two letters
iii. PUSH G
iv. POP H
v. POP four letters
vi. PUSH I, J
vii. POP one letter

(b) Write a C program for polynomial addition using a Linked-list. [10]

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