KADI SARVA VISHWAVIDYALAYA

B.E SEMESTER III EXAMINATION (NOV- 2018)

SUBJECT CODE: CT303 N **SUBJECT NAME: Data Structure and Algorithm**

DATE: 24/11/2018 **TIME: 10:30 to 1:30** **TOTAL:MARKS: 70**

Instructions:

1. **Answer each section in separate Answer sheet.**
2. **Use of scientific Calculator is permitted.**
3. **Al Indicate clearly, the options you attempted along with its respective question number**
4. **Use the last page of main supplementary for rough work**

SECTION 1

Q:1 (All Compulsory)

(A) Briefly explain various linear and non-linear data structures along with their applications. 05

(B) Define the Following Terms: 05

1) Data Structure
2) Sparse Matrix
3) Recursion
4) Primitive data type
5) Circular Linked list

(C) What is Stack? List out different operation of it and write algorithm for any two operation. 05

OR

(C) Write the algorithm of insert and delete of circular queue. 05

Q:2 (A) Write an algorithm for insert and delete operations for doubly linked list 05

(B) Convert given Infix String to Postfix notation using stack (a+b ↑c↑ d) * (e + f/d)) 05

OR

(A) Explain algorithm of Reverse Polish notation. 05

(B) Convert given Infix String to Postfix notation using stack a + b * c – d / e * h 05

Q:3 (A) Explain the Problem of Tower of Hanoi with algorithm. 05

(B) Compare: (1) Linked-list and Array (2) Circular queue and Simple Queue. 05

OR

(A) What is priority queue? Explain the array representation of priority queue 05

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(B) Write a algorithms to insert and delete an element after a given node in a singly linked list. 05

SECTION 2

Q:4 (All Compulsory)

(A) With figure, explain the following terms: (1) Depth of a tree (2) Strictly binary tree (3) Ancestor nodes (4) Graph (5) Minimum spanning tree 05

(B) Explain the difference between insertion sort and selection sort with an example. What is the time complexity of these algorithms? How? 05

(C) List out different hash methods and explain any three methods. 05

OR

(C) Explain Depth First Search and Breadth First Search in graphs with an example 05

Q:5 (A) Explain AVL tree with example 05

(B) Explain the trace of merge sort on following data. 05
42,23,74,11,65,58,94,36,99,87

OR

(A) Write Kruskal's algorithm for minimum spanning tree and explain with an example. 05

(B) Explain the trace of bubble sort on following data. 05
42,23,74,11,65,58,94,36,99,87

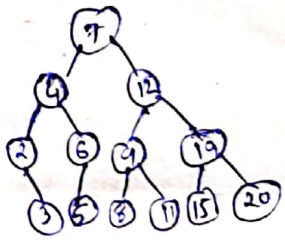
Q:6 (A) Generate a binary search tree for following numbers and perform in-order and post-order traversals: 7, 4, 2, 3, 6, 5, 12, 9, 8, 11, 19, 15, 20. 05

(B) Write Prim's algorithm for minimum spanning tree with an example 05

OR

(A) What is a binary search tree? Create a binary search tree for inserting the following data. 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18.Explain deletion in the above tree. 05

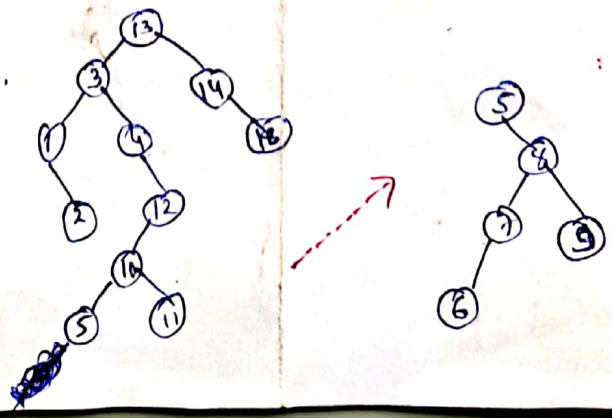
(B) Explain Sequential, Indexed Sequential and Random file organizations. 05



6(A): Inorder : 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 15, 19, 20

Postorder : 3, 2, 5, 6, 4, 8, 11, 9, 15, 20, 19, 12, 7

6(A) - OR



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KADI SARVA VISHWAVIDYALAYA

B.E SEMESTER III EXAMINATION (March- 2019)

SUBJECT CODE: CT303 N **SUBJECT NAME: Data Structure and Algorithm**

DATE: 0 2 / 0 4 / 2 0 1 9 **TIME: 10:30am to 1:30 pm** **TOTAL:MARKS: 70**

Instructions:

1. **Answer each section in separate Answer sheet.**
2. **Use of scientific Calculator is permitted.**
3. **Al Indicate clearly, the options you attempted along with its respective question number**
4. **Use the last page of main supplementary for rough work**

SECTION 1

Q:1 (All Compulsory)

(A) What is Data Structure? Explain different types of Data structure. 05

(B) Define the Following Terms: 05

1) Linear Linked List
2) Sparse Matrix
3) Recursion
4) Priority Queue
5) Primitive Data Type

(C) What is Stack? List out different operation of it and write algorithm for any two operation. 05

OR

(C) Write the algorithm of insert and delete of circular queue. 05

Q:2 (A) Write down advantages of linked list over array and explain it in detail 05

(B) Convert given Infix String to Postfix notation using stack (A-B/C) *(A/K- L) 05

OR

(A) Write an algorithm for insert and delete operations for doubly linked list 05

(B) Convert given Infix String to Postfix notation using stack A * (B + C) * D 05

Q:3 (A) Write a algorithms to insert and delete an element after a given node in a singly linked list. 05

(B) Compare: (1) Array and stack (2) Circular queue and Simple Queue. 05

OR

(A) Explain algorithm of Reverse Polish notation. 05

(B) Explain the Problem of Tower of Hanoi with algorithm 05

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SECTION 2

Q:4 (All Compulsory)

(A) Define the following terms: 05

1. Graph
2. Directed Egde
3. Complete Binary tree
4. sibling
5. Weighted gragh

(B) Explain various Hash collision resolution techniques with examples 05

(C) Write an algorithm for Bubble sort method. Explain each step with an example. 05

OR

(C) Explain Depth First Search and Breadth First Search in graphs with an example 05

Q:5 (A) Write Prim's algorithm for minimum spanning tree with an example 05

(B) Apply quick sort on following data: 42,23,74,11,65,58,94,36, 99, 87 05

OR

(A) Explain the difference between insertion sort and selection sort with an example. What is the time complexity of these algorithms? How? 05

(B) Apply merge sort algorithm for the following data and show the steps. 66, 33, 40, 22, 55, 88, 11, 80, 20, 50, 44, 77, 30 05

Q:6 (A) The Preorder traversal of the tree is: 7, 1, 0, 3, 2, 5, 4, 6, 9, 8, 10 What is the post order traversal and in order traversal? How a general tree can be converted to binary tree? 05

(B) What is MST ? Explain with suitable example Kruskal's algorithm to find out MST. 05

OR

(A) What is a binary search tree? Create a binary search tree for the following data. 14, 10, 17, 12, 10, 11, 20, 12, 18, 25, 20, 8, 22, 11, 23 Explain deleting node 20 in the resultant binary search tree. 05

(B) Explain the structure of indexed sequential file 05

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