B. Tech. SEM -II (Computer Science & Business Systems) (CBCS 2018 Course) : SUMMER - 2019

SUBJECT: DATA STRUCUTRE & PROBLEM SOLVING

Day : Monday
Date : 27/05/2019

S-2019-2521

Time : 10.00 AM To 01.00 PM
Max Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data if **NECESSARY**.

Q.1 What is recursion? Why is it used? How are recursive algorithms analyzed? Explain in detail. **(10)**

OR

Q.1 Define and explain the asymptotic notations for expressing algorithm analysis with the help of appropriate example. **(10)**

Q.2 What is a Queue? How is a circular queue different from a linear queue? Explain the operations on circular queue with its algorithm. **(10)**

OR

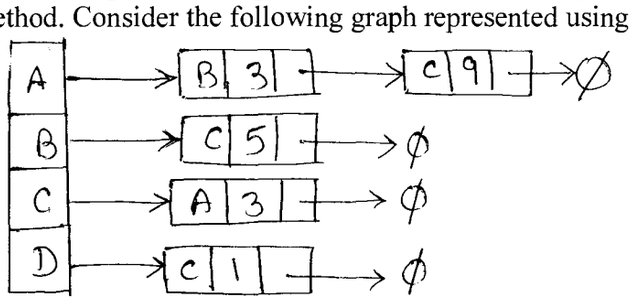
Q.2 Why are linked lists advantageous over arrays? Explain the procedure of inserting into a linked list which maintains the data in a sorted order. **(10)**

Q.3 Why are AVL trees needed? With suitable example explain the balancing techniques for AVL trees. **(10)**

OR

Q.3 With a neat diagram and example, explain any non-recursive traversal of a binary tree. **(10)**

Q.4 Write an algorithm for generating minimum cost spanning tree using Kruskal's method. Consider the following graph represented using Adjacency list **(10)**



Find the minimum Spanning tree for the above graph using Kruskal's method.

OR

Q.4 With a suitable example explain the depth first traversal of a graph. What is the use of this traversal method? **(10)**

Q.5 Sort the following data using merge sort. Show all passes: **(10)**

22 , 3 , 55 , 2 , 60 , 10 , 50 , 14 , 36 , 18

What is the complexity of merge sort in best and worst case?

OR

Q.5 Apply binary search on the following numbers and show all comparisons till the termination of search. **(10)**

23 , 76 , 17 , 9 , 57 , 90 , 45 , 38 , 100 , 79 , 50

The numbers -10 and 17 are to be searched from the list.

Q.6 What is a file? List the different modes of opening files. Explain the Direct Access File organisation in brief. **(10)**

OR

Q.6 What is collision? What are different collision resolution techniques? Explain any one in detail. **(10)**

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