Paper code – U239-124 (ESE)

Total No. of Questions – [6] Total No. of Printed Pages: 3

G.R. No.	

DECEMBER 2019 ENDSEM

S. Y. B.TECH. (COMPUTER ENGINEERING) (SEMESTER – III)

COURSE NAME: DATA STRUCTURE AND ALGORITHMS

COURSE CODE: CSUA21184

(PATTERN 2018)

Time: [2 Hours] [Max. Marks: 50]

Instructions to candidates:
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of scientific calculator is allowed.
4) Assume suitable data where ever required.

Q.1) Attempt any **one**

a) Write algorithm to reverse a string and compare two strings. [4]

b) Write algorithm for addition of 2 sparse matrices. What is its complexity? Add the following two sparse matrices. [4]

Matrix 1:

4 3 4
0 0 5
0 2 8
1 1 5
3 1 9 and

Matrix 2:

4 3 5
0 1 7
1 1 8
1 2 9
2 2 5
3 0 2

Q.2) Attempt any **one**

a) Write pseudo C++ code of quick sort and write average and worst case time complexity. [4]

b) Write pseudo code for binary search with recursion. [4]

Q.3) Attempt any **one**

a) Assume a singly linked list where each node contains student details like name, rollno and percentage of marks. Write a 'C++' function COUNT() to traverse the linked list [6]

and count how many students have obtained more than 60% marks.

b) Explain the insertion of node in double linked list at: the start of the list, the end of the list, After the position. Give example. [6]

Q.4) Attempt any **one**

a) Discuss stack as data structures with its peculiarities and explain the operation ADD and DELETE with proper illustrations for both static and dynamic representations. Demonstrate use of stack to reverse a string with suitable example. [10]

b) What are the disadvantages of linear queue implemented using array? Write C++ code for Circular Queue. List any four applications of Queue and explain any one. [10]

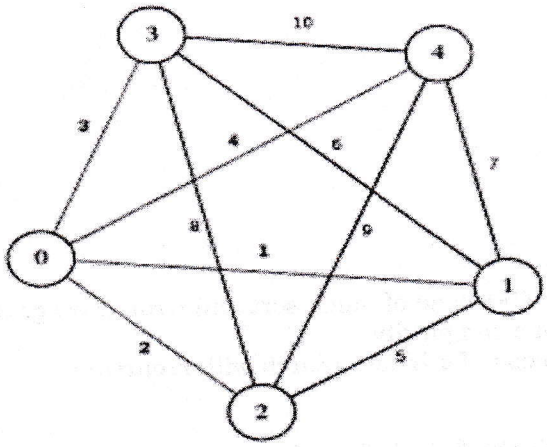
Q.5) Attempt any **one**

a) Write pseudo-code for BST creation. Create and draw stepwise BST for months of the year from January to December. Display created tree using all traversals. [13]

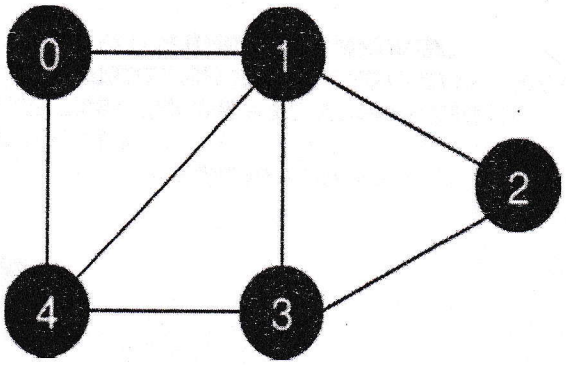
b) Explain significance of Threaded Binary Search Tree. Differentiate between BST and TBST and write node structure of both. Create TBST for given numbers: 6,3,8,1,5,7,11,9,13. Explain any one application of tree. [13]

Q.6) Attempt any **one**

a) What is MST? Write pseudo-code of Prim's algorithm. Find MST for the given example using Prim's algorithm. [13]



b) Explain with suitable example BFS and DFS traversal of graph. Represent the given graph using 1. Adjacency Matrix and 2. Adjacency List. [13]



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