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Paper code - U219-124 (BE - F & FS)

DECEMBER 2019/ENDSEM - Backlog Exam**S. Y. B. TECH. (COMPUTER ENGG.) (SEMESTER - I)****COURSE NAME: FUNDAMENTALS OF DATA STRUCTURE****COURSE CODE: CSUA21174****(PATTERN 2017)**

Time: [2 Hours]

[Max. Marks: 50]

Instructions to candidates:

- 1) Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

Q.1) a) Write a note on different data structure types.

[6]

OR

b) Write the pseudo-code for matrix multiplication. Find the frequency count and explain the complexity of code in asymptotic notation.

[6]

Q.2) a) Explain sparse matrix with suitable example. Write an algorithm for Simple Transpose of sparse matrix.

[6]

OR

b) Write pseudo-code for string palindrome and string concatenation using pointers.

[6]

Q.3) a) Write pseudo-code for delete (all possible positions) operation of circular linked list along-with complexity.

[6]

OR

b) In an organization employee database has to be maintained. What data structure is suitable in this case and why? Explain various functions required for such type of execution along with writing the pseudo-code of these functions.

[6]

Q.4) a) Write pseudo-code for PUSH and POP operation of stack.

[4]

ORb) Convert the following infix notation to postfix notation with stepwise stack contents $(A*B-(C-D))/(E+F)$

[4]

Q. 5) a) Write pseudo-code for insert and delete operation of queue using linked list. [6]

b) Show stepwise queue contents, front and rear value for the following operations on queue. Initially queue contain elements 45, 21, 34

enqueue 10, 56, 15

dequeue,

enqueue 98, 76, 12, 34

dequeue, dequeue

enqueue 45

dequeue, dequeue, dequeue, dequeue [4]

c) Write a note on priority queue. [4 marks]

OR

Q.6) a) Explain with suitable algorithm enqueue and dequeue operation of circular queue. [6]

b) What do you mean by overflow and underflow condition of queue? [4]

Explain doubly ended queue. [4]

c) Explain applications of queue. [4]

Q.7) a) Write binary search algorithm. Explain limitation of linear search method. [6]

b) Sort the following data using selection sort. Show pass-wise output. [4]

34, 12, 67, 8, 23, 10, 32

c) Write pseudo-code for ternary search along-with its complexity. [4]

OR

Q.8) a) Write pseudo-code for bubble sort. What is the complexity of bubble sort? Weather there exists any algorithm better than bubble sort? If yes, name the algorithm. [6]

b) Sort the following data using bubble sort and insertion sort. Show pass-wise output: 142, 317, 45, 222, 187 [4]

c) Search for the key 78 for following set of numbers using ternary search. 34, 45, 56, 67, 78, 89, 90. Show stepwise output. [4]