Total No. of Questions – [03] Total No. of Printed Pages: 01

G.R. No.	

Paper code - U239 - 124 (T1)

OCTOBER 2019/ INSEM (T1)
S. Y. B.TECH. (COMPUTER ENGINEERING) (SEMESTER – III)
COURSE NAME: DATA STRUCTURE AND ALGORITHMS
COURSE CODE: CSUA21184

(PATTERN 2018)

Time: [1 Hour] [Max. Marks: 20]

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

Q 1) Attempt any **one**

a) Let A be a two dimensional array declared as int A[5][5].Assuming that each integer takes four memory location. The first element of the array is stored at location 1250. Find the address of the element A[2][4] for row major and column major representation. What is sparse matrix? Write a C++ function for simple transpose of a sparse matrix. [8]

b) Write a pseudocode for incrementing salary of all employees in a company with increase of 3.2% of basic salary in dearest allowance(DA) and increase of 2% of basic salary in house rent allowance(HRA), where gross salary= basic salary + DA+HRA. Find frequency count and time complexity of the code. [8]

Q.2) Attempt any **one**

a) Write the pseudocode for selection sort. What will be the complexity of selection sort? Sort the following numbers using selection sort and show the output after every pass: 70,7,19,12,1,6,10,22,55,45 [8]

b) What are the searching techniques available to search a record? Which technique is efficient? Justify your answer. Write a C++ function code for Binary search. Write worst case time complexity of Binary search algorithm. [8]

Q 3) Attempt any **one**.

a) Write an algorithm to search a node and replace the data field with the new data in Singly Linked List. [4]

b) Write pseudo-code the insertion of node in double linked list at the required position. [4]