Total No. of Questions – [08] Total No. of Printed Pages: 02

G.R. No.	

Paper code – U218-124 (BE-FF)

MAY 2019/ENDSEM

S. Y. B. TECH. (COMPUTER ENGG.) (SEMESTER - II)

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 whereever required**

Q.1) a) What is the frequency count of a statement? Analyze time complexity of following code? [3]

```
For(i=1;i<=n;i++)
For(j=1;j<=m;j++)
For(k=1;k<=p;k++)
Sum=sum+i
```

b) What is persistent data structure? Give an example. [3]

OR

Define the following with an example. [6]
1. Data type
2.Abstract data type
3.Classification of data structure.

Q.2) a) What is sparse matrix? Write and explain Simple transpose pseudo-code of sparse matrix with example. [6]

OR

b) Describe the following declarations: [6]
i) int *p[5];
ii) int **q;
iii) float (*p) (int no);
iv) int (*q)[3];
v) int * fun1 (int *x);
vi) char s[10][30][80]

P.T.O.

Q.3) a) Discuss insertion and deletion of an element in the circular linked list. Give supporting C++ code and pictorial representation. [6]

OR

b) Write an algorithm for polynomial addition, where the polynomials are represented using linked list. [6]

Q.4) a) Write a C++ program for implementation of stack using array. [4]

OR

b) What is recursion? Demonstrate with one example recursive function to find factorial of given number [4]

Q.5) a) What is the need for circular queue over linear queue? Write pseudo C code to implement circular queue. [6]

b) Write short note on : Priority queue [4]

c) List any four applications of Queue and explain any one. [4]

OR

Q.6) a) Write C++ code for insert and delete operation of Linear queue. Write Time complexity of insert and delete operation of a queue. [6]

b) Define queue. What are conditions for empty and full when queue is implemented as linked list? Explain. [4]

c) Write short note on : Doubly ended queue. [4]

Q.7) a) Write pseudo C++ code for selection sort. Compare selection and bubble sort. [6]

b) Search a given number using binary search, show all passes. Number to be searched 6. 1, 4, 9, 13, 23, 34 [4]

c) Discuss the internal and external sorting by taking suitable example of each type. [4]

OR

Q.8) a) Sort the following data in ascending order using quick sort. Show all passes with pivot: 56, 12, 84, 56, 28, 0, -13, 47, 94 [6]

b) Explain Ternary search with example. [4]

c) Write C code for Binary Search and analyze it's time complexity. [4]