*Total No. of Questions: 4*

**Enrollment No.** EN21CS303029

# Faculty of Engineering

## Mid Sem I Examination September - 2022

## CS3CO31 Data Structure

Programme: B.Tech.CSE  Branch/Specialisation: CSE Core

**Duration: 2 Hrs.**  **Maximum Marks: 40**

---

Q.1 i. Which of these is not an application of a linked list? **1**

a) To implement file systems
b) For separate chaining in hash-tables
c) To implement non-binary trees
d) Random Access of elements

i. What is the time complexity of inserting node at the endof Linked? list? **1**

a) O(1)  b) O(n)
c) O(logn)  d) Either O(1) or O(n)

ii. Which of these is correct way of an array initialization?a)int a[3]={1,3,5}; **1**

b) int a= {1,3,5};
c) int a= {1,3,5};  d) int [] = new int[3]

iii. Which type of linked list stores the address of theheader node in the next field of the last node? **1**

a)singly linked list  b) circular linked list
c) doubly linked list  d) None of these

iv. Which of the following is a linear data structure? **1**

a) Array  b) AVL Tree
c) Binary Tree d) Graphs

v. What is the time complexity of inserting Element at thebegin of Array? **1**

a) O(1)  b) O(n)
c) O(log n)  d) $O(n^2)$

vi. How the 2nd element in an array accessed is based onpointer notation? **1**

a) *a +2  b) *(a+2)
c) *(*a +2)  d) &(a +2)

vii. Which of these is not an application of a linked list? **1**

a) To implement file systems
b) For separate chaining in hash-tables
c) To implement non-binary trees
d) Random Access of elements

viii. Which of the following is the correct declaration oflinked list? 1

a) struct node *
{ int data;
node * link;};

b) struct node
{ int data;
struct node * link;};

c) struct node
{ int data;
a) node * link;}; struct node * link;};

d) struct node*
{ int data;

ix. What are the advantages of arrays? 1

a) Objects of mixed data types can be stored
b) Elements in an array cannot be sorted
c) Index of first element of an array is 1
a) Easier to store elements of same data type

x. Assuming int is of 4bytes, what is the size of intarr[15]?
a) 15 b) 19 c) 11 d) 60

Q.2 i. What is Pointer? 2

ii. a) What Circular Linked List? 3

iii. What is Data Structure? List out the areas in which data structures are applied extensively. 5

OR iv. What is Recursion? Explain its type with example. 5

Q.3 i. Discuss various operations on a data structure. 2

ii. What do you mean by Array? Describe the storagestructure of Array. Also explain various types of Array in details. 8

OR iii. What do you mean by Linked List? Write an Algorithm to insert and delete a node in singly linked list. 8

Q.4 i. a) Write the Application of Linked List 3

ii. Discuss the caparison between Array and Linked List. 7

OR iii. Let X[11][8] be stored in column major order and X[2][2] be stored at 1024 and X[3][3] at 1084.Find theaddress of X[5][3]. 7

*******