

**VIJAYA COLLEGE**  
**R V ROAD, BASAVANGUDI**  
**BANGALORE-04**  
**Model question paper -1**  
**Computer Science**  
**DATA STRUCTURES USING C-CST2**  
**SECTION A**

ANSWER ANY TEN QUESTIONS.

10X2=20

1. What is non-linear data structure?
2. Define space and time complexity of an algorithm
3. What is recursion?
4. What is dynamic memory allocation?
5. What is circular queue?
6. Compare linear search and binary search technique.
7. Write a c function to find number of characters in a string.
8. Differentiate between terminal and non-terminal node of a tree.
9. List disadvantages of a linked list.
10. Mention different ways of graph traversal.
11. List different operations on binary tree.
12. What is binary search tree?

**SECTION-B**

ANSWER ANY FIVE QUESTIONS.

5X10=50

- 13(a). Explain classification of data structures and operations on data structures.  
(b) Explain asymptotic notations.
- 14(a). Write an algorithm to insert an element into an array at a specified position.  
(b) Write a C program to extract a substring from a given string.
- 15(a) write a C function to perform insertion and deletion operation on stack.  
(b) Write a C function to implement bubble sort.
- 16(a) Define a linked list? Explain different types of linked list. Mention the advantages of linked list.  
(b) write an algorithm to insert a node at the beginning of a linked list.
- 17(a) what are stacks? Explain using an example the various operations on a stack.  
(b) write an algorithm to evaluate postfix expression.
- 18(a) write a program to solve Tower of Hanoi problem using recursion.  
(b) What is binary tree? Discuss its properties.
- 19(a) write a program to implement circular queue.  
(b) write an algorithm for the following:
  - (i) in order tree traversal
  - (ii) Post order tree traversal
  - (iii) pre order tree traversal.

20(a) write an algorithm for breadth first search.

(b) Define any 2:

- (i) Degree of a vertex
- (ii) Priority Queue
- (iii) Sparse matrix