Sample Test Paper-I

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD/CW

17330

Semester   : Third

Subject Title : Data Structure using 'C'

Marks   : 25   **Hours: 1 Hrs.**

Q.1: Attempt any THREE.   **09 Marks**

    a. Give a brief description of

        i)   Searching

        ii)   Sorting

        iii) Traversing

    b. State the use of 'Big O' Notation, in the analysis of an algorithm.

    c. Differentiate between the Bubble Sort and Selection Sort methods.

    d. How can a Stack be used as an Abstract Data type?

Q.2: Attempt any TWO.   **08 Marks**

    a. Describe Algorithm analysis in terms of Time Complexity and Space Complexity.

    b. Write an algorithm for the implementation of Quick Sort.

    c. State the different approaches to design an algorithm and describe any one in brief.

Q.3: Attempt any TWO.   **08 Marks**

    a. Write a c program to implement Non recursive implementation of Binary search.

    b. Write in brief about the POLISH Notation.

    c. Write the Push & POP functions in C simulating Push and Pop operations of STACK implemented using an array of integers.

Sample Test Paper-II

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD/CW

17330

Semester   : Third

Subject Title : Data Structure using 'C'

Marks   : 25   **Hours: 1 Hrs.**

Q.1: Attempt any THREE.   **09 Marks**

   a)   State how a Queue can be used as an abstract date type.

   b)   Describe linked list.

   c)   Describe linked representation of a Binary tree.

   d)   State the differences between the Depth First Search (DFS) and the Breadth- First Search (BFS) methods.

Q.2: Attempt any TWO.   **08 Marks**

   a)   Translate following infix expression into its equivalent Postfix expression:

   (a+b) + (c+d) –e*f

   b)   Write in Short about the types of Queues.

   c)   Write a 'c' program to delete the first node, which contains the integer item 'item50', in the info field of a singly linked list.

Q.3 Attempt any TWO.   **08 Marks**

   a)   Construct a binary tree to represent following infix expression.

   (a+b) + (c+d) - e

   b)   Describe the collision resolution techniques.

   c)   Elaborate on the linked list representation of a graph.

Sample Question Paper-II

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD/CW

Semester   : Third

17330

Subject Title : Data Structure using 'C'

Marks   : 100   **Hours: 3 Hrs.**

Q.1 A) Attempt any SIX.   **12 Marks**

- a) State the limitations of the 'Big-O' Notation.
- b) Elaborate on the Space Complexity of an algorithm.
- c) List the various Sorting Techniques.
- d) State the applications of Stack.
- e) Define a complete binary Tree.
- f) Define Directed edge of a Tree
- g) Differentiate between the Radix Sort and Shell Sort methods.
- h) Define Connected Graph.

Q.1 b) Attempt any TWO.   **08 Marks**

- a) Describe the different approaches to design an algorithm
- b) Write a program for sorting the array of 10 elements using the Bubble Sort method.
- c) Describe Priority Queue with its advantages.

Q.2 Attempt any FOUR.   **16 Marks**

- a) Describe linear search with an example.
- b) Find out infix equivalent of the following postfix expression
    - i.   AB+C*D –
    - ii. ABC* + D-
- c) Write a program to print the number of non-zero elements in the list.
- d) Describe concept of Binary Tree and it's applications.
- e) Write a program to calculate the number of items in a Queue.
- f) Write a program for Linear Search of an array.

Q.3 Attempt any FOUR.   **16 Marks**

a) Write a program to convert an infix expression into a Postfix expression.

b) Describe concept of circular queue. How it is better than linear Queue.

c) Describe doubly linked list with an example

d) Write a function to traverse a node of a Binary Tree.

e) Describe Expression Tree with an example.

f) Describe the concept of hashing with it's applications.

Q.4 Attempt any FOUR. **16 Marks**

a) Write a program to sort 10 integers using an array of pointers.

b) Write a program to print 'Fibonacci series', using recursion.

c) Describe Queue as an abstract data type.

d) Write a program to delete the first node from a linked list.

e) Describe Stack using Linked List.

f) Describe the Pre-Order Binary tree traversal algorithm.

Q.5 Attempt any TWO. **16 Marks**

a) Write a program for Selection Sort with its complexity.

b) Convert the following infix expression into a post fix expression.

   (A-2*(B+C)/D*E)+F

c) Describe the collision resolution techniques in hashing with an example.

Q.6 Attempt any TWO. **16 Marks**

a) Write a program to read an integer number. Print the reverse of this number using recursion (ex. 345 to 543).

b) Write a program to count the number of nodes in a Binary search tree.

c) Describe the Breadth First search traversal of a Graph