ASSIGNMENTS

Name of subject: Data Structure Using ‘C’
Subject code: 17330
Semester: III

ASSIGNMENT NO 1

CHAPTER-1 INTRODUCTION TO DATA STRUCTURE (08)

3 Marks
1. Describe big ‘O’ notation used in algorithm.
2. Explain different approaches to design an algorithm.
3. State different types of data types.

4 Marks
1. What is data structure? Why do we need data structure?
2. Define primitive data structure. Give 4 operations of data structure.
3. Define Data Structure? Enlist any two types of non-linear data structures along with example.
4. Explain time and space complexity of an algorithm.
5. Give classification of Data Structure.

ASSIGNMENT NO 2

CHAPTER-2 SORTING AND SEARCHING (16)

3 Marks
1. Write a program to implement linear search.
2. Differentiate between linear and binary search.

4 Marks
1. Write a program to implement bubble sort.
2. Write a program to implement selection sort.
3. Differentiate between linear and binary search.
4. Find the position of element 29 using binary search method in array.
   A={2,3,5,11,17,21,29,43}
5. Arrange the given elements in ascending order using radix sort. A=361,12,527,143,9,768,348
6. Arrange the given elements in the ascending order using merge sort.
   A=15,84,62,08,41,47,33,18,51,32
7. Arrange the given elements in the ascending order in quick sort.
   A=3,12,5,19,1,17
8. Arrange the given elements in the ascending order using insertion sort.
   A=77,33,44,11,88,22,66,55

ASSIGNMENT NO 3

CHAPTER-3 STACKS (18)

3 Marks

1. Define the term ‘overflow’ and ‘underflow’ with respect to stack.
2. Write an algorithm for ‘push’ operation.
3. What is a recursion?

4 Marks

4. State the principle of stack with basic operations
5. Translate the given infix expression to postfix expression using stack.
   
   \[((A+B)*D)^{(E-F)}\]
6. Evaluate following postfix expression.
   A: 6,2,3,+,−,3,8,2,+,*,2,^,3,+
7. Write a program to find the factorial of a given number using recursion.
8. Convert following expression into prefix expression.
   \((A+B)*C-D/E*(F/G)\)
ASSIGNMENT NO 4

CHAPTER-4 QUEUES

5 Marks

1. Explain Queue as an abstract data type.
2. Define the circular queue with example.

6 Marks

1. Define any two terms with Example.
   - Dequeue
   - Priority queue
   - Linear queue
2. Define Consider the following queue of character , where QUEUE is circular array which is allocated six memory cells
   - FRONT=2, REAR=4, QUEUE= ___, A, C, D, ___, ___. Describe queue
     - as following operation takes place: 1. F is added to Queue.
     - 2. Two
     - letters are
     - deleted
     - 3. K, L, M
     - are added
     - to queue.
     - 4. S is
     - added to
     - queue.
3. Write a c program to implement a queue with insert operation.

ASSIGNMENT NO 5

CHAPTER-5 LINKED LIST

3 Marks

1. List types of linked list.
2. Define the following terms:
   a) Null pointer  b) next pointer  c) empty list  d) address
3. Describe Doubly Linked list with suitable example
4 Marks

1. Write Algorithm for insertion of new node at start and End in singly linked list.
2. Describe the structure of circular linked list.

ASSIGNMENT NO 6

CHAPTER-6 TREES

2 Marks

1. Explain one of the following binary search operation with example.
   Insertion of Node
   Deletion of Node
2. Draw the tree structure for the following expression. (any two)
   \[(a-3b) (2x-y)^3 \]
   \[(2a+5b)^3 (x-7y)^4 \]
   \[(2a+5b)^3 (x-7y)^4 \]
3. Define
   1. AVL tree
   2. Weight balanced tree
4. Construct a binary search tree from the given list of letters inserted in order into all empty binary search tree.

1 Marks

1. Explain Binary tree with Example.
2. Define following terms related to binary tree:
   level,
   depth,
   path
   degree of node
3. Suppose Following eight numbers are added in order into empty binary search tree T. 50, 33, 44,22,77,35,60,40.
   Draw the tree T and search an item 20 in the tree.
4. Draw the tree structure of the expression given below:
   \[( + 2 + 3 + 4 + 5 + 6)^2 \cdot (7 + 4)^2 \]
ASSIGNMENT NO 7

CHAPTER-7  GRAPH & HASHING

3 Marks

1. Explain Linked representation of graph with suitable Example
2. Describe Hash Function. Explain Different Hash Function

4 Marks

1. Consider the following Graph. Find its adjacency Matrix & Path Matrix by using Sequential Representation of Graph. (4 Marks)

2. Describe application of graph in data structure.
3. Write the Breadth First Search algorithm.