F.Y.BSc.CS

Assignment Questions

Subject/Course: Design & Analysis of Algorithms

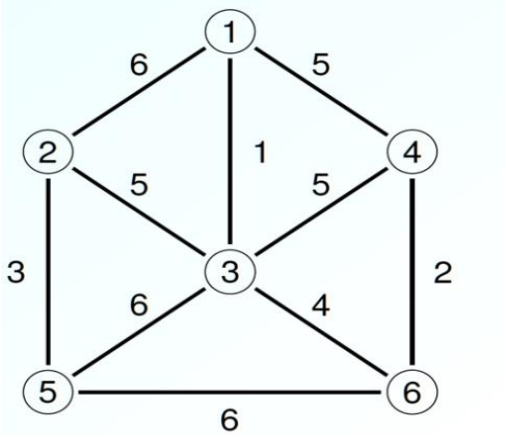
ASSIGNMENT - 1

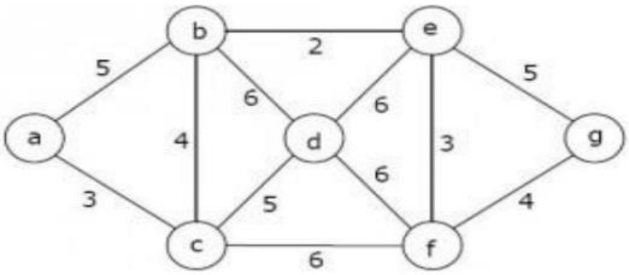
1. Define an algorithm . Explain Big - Oh notation with a neat graph.
2. Write an algorithm step to solve and sort the following elements using Selection sort. State any two advantages and disadvantages.
   64, 34, 25, 5, 11, 90, 12
3. What is Recursion ? Recall and analyse the Tower of Hanoi problem with a neat diagram.
4. What are the Stack operations? explain them in detail with examples.
5. What is the need for an algorithm? Draw and explain the graph of Big - Theta notation.
6. Write a code in C++ to take input from the keyboard to perform the Fibonacci series sequence such as starting from 0 and 1.
7. Write an algorithm step to solve and sort the following elements using Bubble sort. State any two advantages and disadvantages.
   10, 3, 7, 9, 6, 2, 5
8. Compare Linear search v/s Binary search.
9. What is linked list? Consider and Evaluate a polynomial using linked list such as $P(x) = 7 x^3 + 4 x^2 - 6 x + 7$
10. Convert the following expression into a postfix expression.
    A + B * C / D - F + A ^ E
11. What is a two dimensional Array? Write a program to implement the use of a 2-d array.
12. Define Rate of Growth. Discuss and explain any three types of Rate of Growth Analysis.

Assignment 2

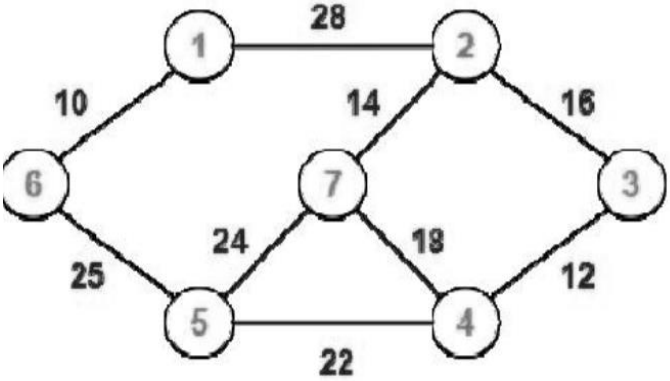
1. Suppose we have a 10,8,23,5,9,6 unsorted array. Apply Binary Search to sort in an ascending order. Write the algorithm steps for the Binary Search algorithm.

2. Analyse the graph below and perform the Prim's Minimum spanning tree algorithm. Write the steps for the Prim's algorithm.





3. What is Dynamic Programming? List some common real - world applications of dynamic programming.
4. Explain Naive algorithm , KMP and Rabin - Karp with advantages and disadvantages. For the given string pattern such as - Text - AABABAAABAABAAAB, Pattern - ABA
5. Write the algorithm for Merge sort. Analyze the unsorted array such as 64, 34, 25, 5, 11, 90, 12 and apply the Merge sort algorithm to make it in ascending order.
6. For the given graph,Construct the Minimum spanning tree using Prim's algorithm.
7. Construct the minimum spanning tree (MST) for the given graph using Kruskal's algorithm.



8. Differentiate between Linear and Binary Search.