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Assignment No. 2

Programme Name: MCA	**Semester: 1 Credit: 4**
Course Title : Design and Analysis of Algorithms	**Course Code: 22ODMCH611**
Submitted Date:	**Last date of Submission: 31st May,2022**
Max. Marks: 30	**Weightage: 50% (15 Marks)**

Instructions:

- *Sec-A is compulsory which consists of **Ten** Short Answer Questions (1 mark per question). Answer length should be approximately 100 words.*
- *Attempt any **Five** questions from Sec-B out of Seven questions (4 marks per question). Answer length should be approximately 800 words.*

SECTION A (10 MARKS)

1. Define performance analysis of algorithm.
2. Explain the significance of an asymptotic notation.
3. How to check if two strings are rotation of each other.
4. Entries in a stack are 'ordered'. What is the meaning of this statement?
5. List the advantages and disadvantages of divide and conquer method.
6. What is optimal tree problem?
7. Define Warshall algorithm.
8. State the basic principle behind Bellman-Ford algorithm.
9. How many edges will a tree consisting of N nodes have?
10. What exactly do you mean by a partial solution in branch and bound terminology?

SECTION B (20 MARKS)

11. Explain the single–source shortest paths algorithm with suitable example.

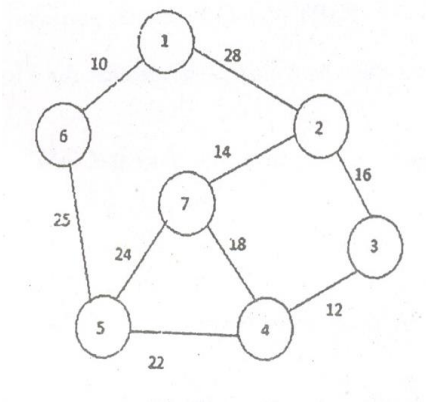
12. Describe why analysis of algorithm is important. Exemplify Worst Case, Best Case & Average Case complexity.

13. Sort a given set of elements at runtime using the Merge sort method.

14. Solve following 0/1 knapsack problem where n=5, (P1, P2,... , P5) = (16,12,2,5,6), (w1, w2, ...,w5) = (7, 5,3,2, 8) and M = 17.

15. Solve the making change problem using dynamic programming. (Denominations: d1=1, d2=4, d3=6). Give your answer for making change of Rs. 8.

16. Apply Kruskal's algorithm to the following graph:



17. Elaborate the Graph- coloring problem. Draw the state space tree for m= 3 colors n=4 vertices graph. Discuss the time and space complexity.