**CS702 – Advanced Algorithms Analysis and Design**

**Special Assignment**

**Opening Date: 31/12/2020**

**Due Date: 31/12/2020**

**Instructions to Solve Assignments**

It is expected that students will solve assignments by themselves. The Following rules that will apply during the evaluation of the assignment.

* Cheating from any source will result zero marks in the assignment.
* In case of cheating from other student, both of the students will be graded with zero marks.
* No assignment after the due date will be accepted.

**Answer the following questions in your own words. Plagiarism will be checked for each question. Marks will be awarded on the basis of the answer and plagiarism report.**

**Question 1 (10 Marks)**

Postage ticket of amount ≥ n0 cents can be formed using only 4 cent and 9 cent coins. You are required to find the minimum n0.

**Question 2 (10 Marks)**

Prove that 53*n*2 + 359*n* + 1237 = Θ(*n*2)

**Question 3 (15 Marks)**

There are two assembly lines, as shown in the diagram below, each with 6 stations. The auto is required to go through from all of these 6 stations from left to right. Nodes represent stations. The assembly time at each station is shown at each node. The entering and exit times for an auto are also given. The transfer time is represented at the edges when an auto moves to next station on a different line. There is no transfer time if it stays on the same line. Determine which stations to choose from lines 1 and 2 to minimize total time through the factory. Also compute the optimal value in terms of time. Use Dynamic Programming Approach. You need to calculate fi[j], li[j], f\*, l\* and the optimal path.



**Question 4 (15 Marks)**

For the sequence of matrices [A1, A2, A3, A4, A5], compute the order of the product, A1.A2.A3.A4.A5, in such a way that minimizes the total number of scalar multiplications, using dynamic programming. The order of matrices is given below:

Order of A1 = 25 × 15

Order of A2 = 15 × 30

Order of A3 = 30 × 40

Order of A4 = 40 × 10

Order of A5 = 10 × 20