Your handwriting must be legible, and your answers should be rigorous, concise and in proper order. Please note that the work handed in must be your own.

1. CLRS 15.2-1 (Page 338) Find an optimal parenthesization of a matrix-chain product of six matrices A, B, C, D, E, F with dimensions 5 x 10, 10 x 3, 3 x 12, 12 x 5, 5 x 50, 50 x 6. Report both the parenthesization and the cost.

2. The partition problem is, given a set of $n$ nonnegative integers as input, to find a way to partition this set into two disjoint subsets so that the sums of the integers in each of the two subsets are equal. The subset sum problem is, given a set of $n$ nonnegative integers and an integer $k$ to find a subset such that the sum of the integers in the subset is equal to $k$.
   
   a. Prove that the subset sum problem is in NP.
   b. If it is known that the partition problem is NP-complete, prove that the subset sum problem is also NP-complete, by using Polynomial Reduction technique.

3. CLRS 35-1. (Page 1049)

4. Write a CREW PRAM algorithm to compute the sum of $n$ integers in $O(\log n)$ time.