1. Suppose you have a brand new processor called "ProcessorX " which generates 4.5E12 instructions while executing a program. The instructions are divided into classes as follows: 10% class A, 20% class B, 50% class C, and 20% class D. It comes with a clock rate of 2.5 GHz and CPIs of 1, 2, 3, and 3 respectively for each class of instructions. **Find** the increase in CPU time if the number of instructions is increased by 10% and the average CPI is increased by 5%. [5]

2. Processor A has a clock cycle time of 4ns, average CPI of 0.7. P2 has a clock cycle time of 3.5ns, an average CPI of 0.7. Both of the computers have the same ISA. **Determine** which computer is faster and by **how** much? [3+2]

3. Given that Computer has a MIPS of 5, and it requires 5 seconds to execute a specific prog is 2. **Determine** the number of total clock cycles for that program. [2]

Question - 4:

Consider a computer running a program that requires 250s, with 70s spent executing add instructions, 85s executed sub instructions, and 40s spent executing left-shift instructions.

    a. By how much is the total time reduced if the time for add operations is reduced by 20%?

    b. Can the total time can be reduced by 20% by reducing only the time for left-shift instructions?