

Question 1 (25 points): You have been hired by Proyota, a manufacturer of embedded processors for cars. A new 8-bit processor is being designed and you need to help answer some questions about the processor. This processor has eight 8-bit registers named R0, R1, ..., R7, and also operates with an 8-bit word. Answer the following questions:

- a. (10 points) In the table below indicate the values, in the specified forms, that can be stored in an 8-bit register

Description	Binary	Hexadecimal	Decimal
Largest unsigned integer			
Most positive 2-complement integer			
Most negative 2-complement integer			

Assume that the format for arithmetic instructions in this processor is as follows:

```
add    Ra, Rb, Rc          # Ra <-- Rb + Rc
sub    Ra, Rb, Rc          # Ra <-- Rb - Rc
```

Assume that the following values (given in binary) are stored in registers: R1 = 0100 0011, R2 = 0100 0000, and R3 = 0100 0001.

- b. (15 points) What is the result, expressed in decimal, produced by the following sequence of instructions? Is it correct? If not, why not? If the code does not produce the expected result, is there a way to rewrite it to produce correct result? If yes, write the code that performs the correct operation.

```
add    R4, R2, R3
sub    R5, R1, R4
```