EE2026 (Part 1)
Tutorial 2 - Questions

Signed Binary Numbers

1. Convert the following decimal numbers into 8-bit signed magnitude representations:
   (a) +127 (b) -0 (c) -55

2. Convert the following signed decimal numbers into 10 bit 1's complement representations.
   (a) +43 (b) -1 (c) -128

3. Convert the following 2's complement numbers to their signed decimal equivalents:
   (a) 10000 (b) 10000001

4. (a) What is the ordinary 8 bit binary equivalent of the decimal number 250?
   (b) What decimal number does the above bit pattern correspond to if interpreted as
   i) a signed magnitude number
   ii) a 1's complement number and
   iii) a 2's complement number?

5. Convert the following 4-bit 2's complement numbers to 8-bit 2's complement numbers.
   (a) $(0101)_{2's}$ (b) $(1010)_{2's}$

6. Show how the following can be added in 2's complement notation using **8-bit** arithmetic

   (a) (-1) + 45 (b) -128 + (-60)

7. Compute and give the final answer in 2's complement notation:
   $(10100)_{2's}$ + $(00100)_{SM}$