1.

a) 10011010010
b) 11110110001

2.

a) 50
b) -10

3.

Extend the division method for converting decimal numbers to binary numbers. To convert a number "N" to base system "B" go on dividing N by B until the number reduces to zero. Read the remainders as in division method to get the final answer.

a) 133
b) 202
c) 50

4.

Yes, this is a good choice. Each additional level of interpretation costs something in time, hence slows the execution process. Therefore, if it is not needed, it should be avoided. By executing the common instructions at the microprogram (instead of the operating system), we are avoiding an extra interpretation step and hence speeding up the process.

5.

a) same as -3 + (-3) = -6; (11111010) No overflow.
b) same as -3 – (-1) = -2; (11111110) No overflow.
c) same as 1 – (-1) = 2; (00000010) No overflow.
d) same as -128 – (-126) = -2; No Overflow.

6.

a) Invalid, as T is not part of hex characters
b) Valid