Q1: 01101010

$(1 \cdot 2^1) = 2$
$(1 \cdot 2^3) = 8$
$(1 \cdot 2^5) = 32$
$(1 \cdot 2^6) = 64$

$\boxed{106_2}$

Q2: $0001 \quad 0010 \quad 1010 \quad 1101$
$\quad\quad 1 \quad\quad 2 \quad\quad 10 \quad\quad 13 \Rightarrow \boxed{12AD}$
$\quad\quad\quad\quad\quad\quad\quad\quad A \quad\quad\quad D$

10	11	12	13	14	15
A	B	C	D	E	F

Q3: 0×123456

$(4 \cdot 6) = 24-\text{bits}$ since there are 4-bits for each hex digit.

Q4: 1-byte = 8 bits

50-bits / 8 bits $\simeq$ 6.25 bits meaning that a 50-bit number requires $\boxed{7-\text{bytes}}$ of memory to be stored.

Q5: $200_{10} = 11001000_2$

$1 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0$

128
64
8
200

$1100 \quad 1000 \Rightarrow \boxed{0 \times C8}$
$\quad 12 \quad\quad 8$
$\quad C$

$(12 \times 16^1) + (8 \times 16^0)$
$192 + 8$
$200.$

Q6: 11011010_2 signed number.

$\rightarrow 2$
$\rightarrow 8$
$\rightarrow 16$
$\rightarrow 64$
$\rightarrow -128$

$\boxed{-38_{10}}$

Q7: $23_{10} = \dfrac{?}{8}$

$0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 1 \quad 1 \quad 1$

$23_{10} = 10111_2$

$010 \quad 111$
$(2 \cdot 8^1) + (7 \cdot 8^0) = 23$

$\Rightarrow \boxed{23_{10} = 27_8}$

Q8: $\boxed{-54_{10} = 11001010_2}$

$54_{10} = 0 \quad 0 \quad 1 \quad 1 \quad 0 \quad 1 \quad 1 \quad 0_2$
$\rightarrow 2$
$\rightarrow 4$
$\rightarrow 16$
$\rightarrow 32$
$\quad\quad 54_{10}$

Two's complement
11001001
$\quad\quad\quad +1$
$\boxed{11001010_2}$

Q9: $\boxed{11.11_2 = \dfrac{3.75}{10}}$

11.11
$\rightarrow 1 \cdot 2^{-2} = \frac{1}{2^2} = \frac{1}{4} = 0.25$
$\rightarrow 1 \cdot 2^{-1} = \frac{1}{2} = 0.5$
$\rightarrow 1 \cdot 2^0 = 1$
$\rightarrow 1 \cdot 2^1 = 2$
$\quad\quad 3.75_{10}$

Q10: $10_{10} = 0001000_{BCD}$

$1 \quad 0 \quad 1 \quad 0_2$
$\rightarrow 2$
$\rightarrow 8$
10_{10}

Binary Coded Decimal
For every bit of decimal, we need to write a bit binary conversion

$1 \quad\quad 0$
$\downarrow \quad\quad \downarrow$
$0001 \quad 0000$

$\boxed{00010000_{BCD}}$