PRACTICAL - 2

01) Binary to Decimal

a) $(0101)_2 \longrightarrow (?)_{10}$

$1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2 + 0 \times 2^3$

$1 + 0 + 4 + 0$

$= (5)_{10}$

b) $(0111)_2 \longrightarrow (?)_{10}$

$\Rightarrow 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$

$\Rightarrow 0 + 4 + 2 + 1$

$\Rightarrow (7)_{10}$

c) $(0011)_2 \longrightarrow (?)_{10}$

$0 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$

$= 2 + 1$

$= (3)_{10}$

d) $(1001)_2 \longrightarrow (?)_{10}$

$= 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$

$= 8 + 1$

$= (9)_{10}$

e) $(1011)_2 \longrightarrow (?)_{10}$

$= 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$

$\Rightarrow 8 + 0 + 2 + 1$

$\Rightarrow (11)_{10}$

f) $(1111)_2$

$= 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$

$= 1 + 2 + 4 + 8$

$= (15)_{10}$

g) $(0000)_2 \longrightarrow (?)_{10}$

$= 0 \times 2^0 + 0 \times 2^1 + 0 \times 2^2 + 0 \times 2^3 + 0 \times 2^4$

$= 0 + 0 + 0 + 0$

$= (0)_{10}$

h) $(1101)_2$

$\hookrightarrow (?)_{10}$

$= 1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2 + 1 \times 2^3$

$= 1 + 0 + 4 + 8$

$= (13)_{10}$

02) Conversion Binary to Decimal

a) $(00010101)_2 \longrightarrow (?)_{10}$

$\rightarrow 1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2 + 0 \times 2^3 +$

$1 \times 2^4 + 0 \times 2^5 + 0 \times 2^6 + 0 \times 2^7$

$\rightarrow 1 + 4 + 16$

$\rightarrow (21)_{10}$

b) $(10110101)_2 \longrightarrow (?)_{10}$

$\rightarrow 1 \times 2^0 + 1 \times 2^2 + 1 \times 2^4 + 1 \times 2^5 + 1 \times 2^7$

$\rightarrow 1 + 4 + 16 + 32 + 128$

$\rightarrow (181)_{10}$

c) $(11010011)_2 \longrightarrow (?)_{10}$

$\rightarrow 1\times2^0 + 1\times2^1 + 0\times2^3 + 0\times2^4 + 1\times2^4 + 0\times2^5$

$+ 1\times2^6 + 1\times2^7$

$\rightarrow 3 + 16 + 64 + 128$

$\rightarrow (211)_{10}$

d) $(01101000)_2 \longrightarrow (?)_{10}$

~~$\rightarrow 1\times2^3 + 1\times2^5 \times 1\times2$~~

$\rightarrow 1\times2^3 + 1\times2^5 + 1\times2^6$

$\rightarrow 8 + 32 + 64$

$\rightarrow (104)_{10}$

03) Binary to decimal

a) $(1011010100010101)_2 \longrightarrow (?)_{10}$

$= 1\times2^0 + 1\times2^2 + 1\times2^4 + 1\times2^8 + 1\times2^{10}$

$+ 1\times2^{12} + 1\times2^{13} + 1\times2^{15}$

$= 1 + 4 + 16 + 256 + 1024 +$

$4096 + 8192 + 32768$

$= (46357)_{10}$

b) $(0110100011010011)_2 \rightarrow (?)_{10}$

$\rightarrow 1\times2^0 + 1\times2^1 + 1\times2^4 + 1\times2^6 + 1\times2^7$

$+ 1\times2^{10} + 1\times2^{13} + 1\times2^{14}$

$\rightarrow 1 + 2 + 16 + 128 + 2048 + 8192$

$+ 16384$

$\rightarrow (26835)_{10}$

Q3 True / false

a) $(1001)_2 < (5)_{10}$ false

b) $(0111)_2 = (1111)_{10}$ false

c) $(0011)_2 > (2)_{10}$ True

d) $(1001)_2 > (1101)_2$ False

e) $(1011)_2 = (11)_{10}$ True

f) $(1111)_2 = (15)_{10}$ True

g) $(0000)_2 <= (0)_{10}$ False

h) $(1101)_2 > (1010)_2$ True