

1. Convert the following numbers directly to binary *without using an intermediary base*:

a. $(3E89.AC27)_{16}$ _____ (2 Marks)

b. $(22144.3561)_8$ _____ (2 Marks)

2. Convert $(1100110111001010.1011101)_2$ to:

a. Octal _____ (2 Marks)

b. Hexadecimal _____ (2 Marks)

Don't use an intermediary base.

3. Convert the following numbers to decimal:

a. $(8.3)_9$ _____ (2 Marks)

b. $(50)_7$ _____ (2 Marks)

Solution:

1a.

$(3E89.AC27)_{16}$
 converting each digit into its equivalent 4 bits:
 $\rightarrow (16) \rightarrow 3 \quad E \quad 8 \quad 9 \quad . \quad A \quad C \quad 2 \quad 7$
 $(2) \rightarrow 0011 \quad 1110 \quad 1000 \quad 1001 \quad . \quad 1010 \quad 1100 \quad 0010 \quad 0111$
 $\Rightarrow (3E89.AC27)_{16} = (0011111010001001.101011000010011)_2$

1b.

$(22144.3561)_8$
 $\rightarrow (8)$ converting each digit into its equivalent 3 bits:
 $\rightarrow 2 \quad 2 \quad 1 \quad 4 \quad 4 \quad . \quad 3 \quad 5 \quad 6 \quad 1$
 $(2) \rightarrow 010 \quad 010 \quad 001 \quad 100 \quad 100 \quad . \quad 011 \quad 101 \quad 110 \quad 001$
 $\Rightarrow (22144.3561)_8 = (010010001100100.011101110001)_2$

2a.

$(1100110111001010.1011101)_2$
 Splitting the given No. into 3 Bits groups
 $(2) \rightarrow \underline{001} \underline{100} \underline{110} \underline{111} \underline{001} \underline{010} . \underline{101} \underline{110} \underline{100}$
 $(8) \rightarrow 1 \quad 4 \quad 6 \quad 7 \quad 1 \quad 2 \quad 5 \quad 6 \quad 4$
 $\Rightarrow (1100110111001010.1011101)_2 = (146712.564)_8$

2b.

$(1100110111001010.1011101)_2$
 Splitting the given No. into 4 bits groups
 $(2) \rightarrow \underline{1100} \underline{1101} \underline{1100} \underline{1010} . \underline{1011} \underline{1010}$
 $(16) \rightarrow C \quad D \quad C \quad A \quad . \quad B \quad A$
 $\Rightarrow (1100110111001010.1011101)_2 = (CDCA.BA)_{16}$

3a.

$(8.3)_9$
 $= 8 \times 9^0 + 3 \times 9^{-1}$
 $= (8.333)_{10}$

3b.

$(50)_7$
 $= 5 \times 7^1 + 0 \times 7^0$
 $= (35)_{10}$