

$$\begin{array}{r} 5 \overline{) 21} \\ \underline{5 \times 4} \\ 14 \\ \underline{5 \times 2} \\ 40 \\ \underline{5 \times 8} \\ 0 \end{array}$$

$$= (41 \overline{2043})_5$$

Base 2k Conversion

1.3.3 Base 2^k Conversion

In converting a base p number to base q , if p and q are both integral powers of 2, the base p number can first be converted to binary, and this in turn can be converted to base q by inspection. This conversion procedure is called the *base 2^k conversion*.

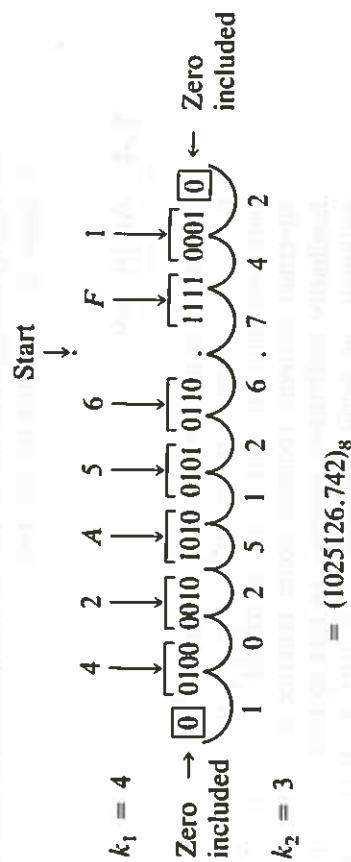
Example 1.13

$$(42A56.F1)_{16} = (?)_8$$

$$p = 16 = 2^4, \quad q = 8 = 2^3$$

Therefore,

$$k_1 = 4, \quad k_2 = 3$$



Example 1.14

$(AF5.2C)_{16} = (?)_4$

A	F	5	.	2	C
↓	↓	↓	↓	↓	↓
1010	1111	0101	0010	1100	
2 2 3 3	1 1 0 2	3 0			

$= (223311.0230)_4$

Example 1.15

$(567.23)_8 = (?)_{16}$

5	6	7	2	3		base 8	$\therefore k_1 = 3$
↓	↓	↓	↓	↓			
0 0 0	1 0 1	1 1 0	1 1 1	0 1 0	0 1 1	0 0 0	
Zeros included							
1	7	7	4	C			base 16 $\therefore k_2 = 4$

$$= (177.4C)_{16}$$

It is thus possible to represent binary numbers in a very compact form by using octal and hexadecimal systems. The conversion between these