

Reference  $\rightarrow$  2, 4, 8, 16, 32, 64, 128, 256  
For Conversions

Convert the following decimal numbers to Binary

1.  $45_{10} : \boxed{101101_2}$

$$\begin{array}{l} 45/2 = 22 \text{ R1} \\ 22/2 = 11 \text{ R0} \\ 11/2 = 5 \text{ R1} \\ 5/2 = 2 \text{ R1} \\ 2/2 = 1 \text{ R0} \\ 1/2 = 0 \text{ R1} \end{array}$$

2.  $169_{10} : \boxed{10101001_2}$

$$\begin{array}{l} 169/2 = 84 \text{ R1} \\ 84/2 = 42 \text{ R0} \\ 42/2 = 21 \text{ R0} \\ 21/2 = 10 \text{ R1} \\ 10/2 = 5 \text{ R0} \\ 5/2 = 2 \text{ R1} \\ 2/2 = 1 \text{ R0} \\ 1/2 = 0 \text{ R1} \end{array}$$

3.  $243_{10} :$

$\boxed{11110011_2}$

$$\begin{array}{l} 243/2 = 121 \text{ R1} \\ 121/2 = 60 \text{ R1} \\ 60/2 = 30 \text{ R0} \\ 30/2 = 15 \text{ R0} \\ 15/2 = 7 \text{ R1} \\ 7/2 = 3 \text{ R1} \\ 3/2 = 1 \text{ R1} \\ 1/2 = 0 \text{ R1} \end{array}$$

4.  $111_{10} : \boxed{1101111_2}$

$$\begin{array}{l} 111/2 = 55 \text{ R1} \\ 55/2 = 27 \text{ R1} \\ 27/2 = 13 \text{ R1} \\ 13/2 = 6 \text{ R1} \\ 6/2 = 3 \text{ R0} \\ 3/2 = 1 \text{ R1} \\ 1/2 = 0 \text{ R1} \end{array}$$

5.  $77_{10} :$

$\boxed{1001101_2}$

$$\begin{array}{l} 77/2 = 38 \text{ R1} \\ 38/2 = 19 \text{ R0} \\ 19/2 = 9 \text{ R1} \\ 9/2 = 4 \text{ R1} \\ 4/2 = 2 \text{ R0} \\ 2/2 = 1 \text{ R0} \\ 1/2 = 0 \text{ R1} \end{array}$$

6.  $212_{10} : \boxed{11010100_2}$

$$\begin{array}{l} 212/2 = 106 \text{ R0} \\ 106/2 = 53 \text{ R0} \\ 53/2 = 26 \text{ R1} \\ 26/2 = 13 \text{ R0} \\ 13/2 = 6 \text{ R1} \\ 6/2 = 3 \text{ R0} \\ 3/2 = 1 \text{ R1} \\ 1/2 = 0 \text{ R1} \end{array}$$