

# Division of Unsigned Integer - Restoring Division Mthd

Eg:  $11 \div 3 \rightarrow \text{Dividend } (Q) = 11 = (1011)_2$

Divisor  $(M) = (00011)_2 \rightarrow (n+1 = 5 \text{ bits})$

$-M = 2' \text{ comp } (M) = (11101)_2$

$n$	$(n+1)$ $M$	$(n+1)$ $A$	$(n)$ $Q$	Act <sup>n</sup> /Operat <sup>n</sup>
4	00011	00000	1011	Init <sup>n</sup>
3	$\begin{array}{r} 00001 \\ 11110 \\ \hline 00001 \end{array}$	00001	011_	S.L A, Q
		11110	011_	$A - M \text{ i.e. } A + (-M)$
		00001	0110	$Q[0] \leftarrow 0$ Restore A, <u><math>n-1</math></u>
2	$\begin{array}{r} 00010 \\ 11111 \\ \hline 00010 \end{array}$	00010	110_	S.L A, Q
		11111	110_	$A + (-M)$
		00010	1100	$Q[0] \leftarrow 0$ , Restore A, $n-1$
1	$\begin{array}{r} 00101 \\ 00010 \\ \hline 00101 \end{array}$	00101	100_	S.L A, Q
		00010	100_	$A + (-M)$
		00101	1001	$Q[0] \leftarrow 1$ , $n-1$
0	$\begin{array}{r} 00101 \\ 00010 \\ \hline 00101 \end{array}$	00101	001_	S.L A, Q
		00010	001_	$A + (-M)$
		00101	0011	$Q[0] \leftarrow 1$ $n = n-1$
		<u>00010</u>	<u>0011</u>	
	Reminder	Quotient		
	<u><math>(2)_{10}</math></u>	<u><math>(3)_{10}</math></u>		