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Q1) $A = 15.25_{10}$ in Binary $1111.01_2 = 1.11101 * 2^3$

$S_A = 0$ +ve, e_A = bias + 3 = 0111 1111 + 0000 0011 = 1000 0010

m_A = 111 010 00 → 0

A = | 0 | 1000 0010 | 111 010 | 0 |

23 bits

Representation of A

$B = -0.25_{10} = -0.01_2 = -1.0 * 2^{-2}$

$S_B = 1$ -ve, $e_B = -2 + 127 = 0111\ 1111 + 1111\ 1110 = 0111\ 1101$

m_B = 0000 → 0

B = | 1 | 0111 1101 | 000 | 0 |

Representation B

Comparison of exponents $e_A > e_B$

Difference of exponents $e_A - e_B$ = 1000 0010 − 0111 1101 = 0000 0101

= 1000 0010 + 0000 0011 = 0000 0101

shift smaller operant by 0000 0101 = 5_{10} to the right

m_B = 1.00000 → $* 2^{-5}$ = 0.0001 $\quad -m_B = 1.1110 + = 1.1111$

Now A $m_A + m_B$

1.11101 + (− 0.00001) = 001.11101 + 111.1111

= 01.11100

m_{Result} = 01.111000 —— 0 $* 2^3$

NORMALIZATION → NOT Required Subtraction

Rounding → NOT Required $R(M_0 + S) = 0$

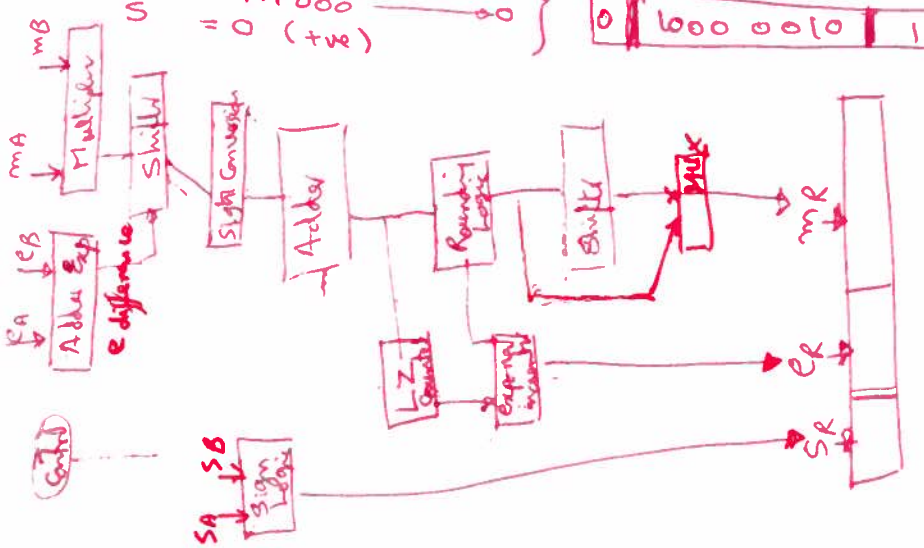
∴ $e_R = e_A$ = 1000 0010

m_R = 111 000 → 0

S = 0 (+ve)

| 0 | 1000 0010 | 111 00000 | 0 |

23bits



Please see class notes for more detail.

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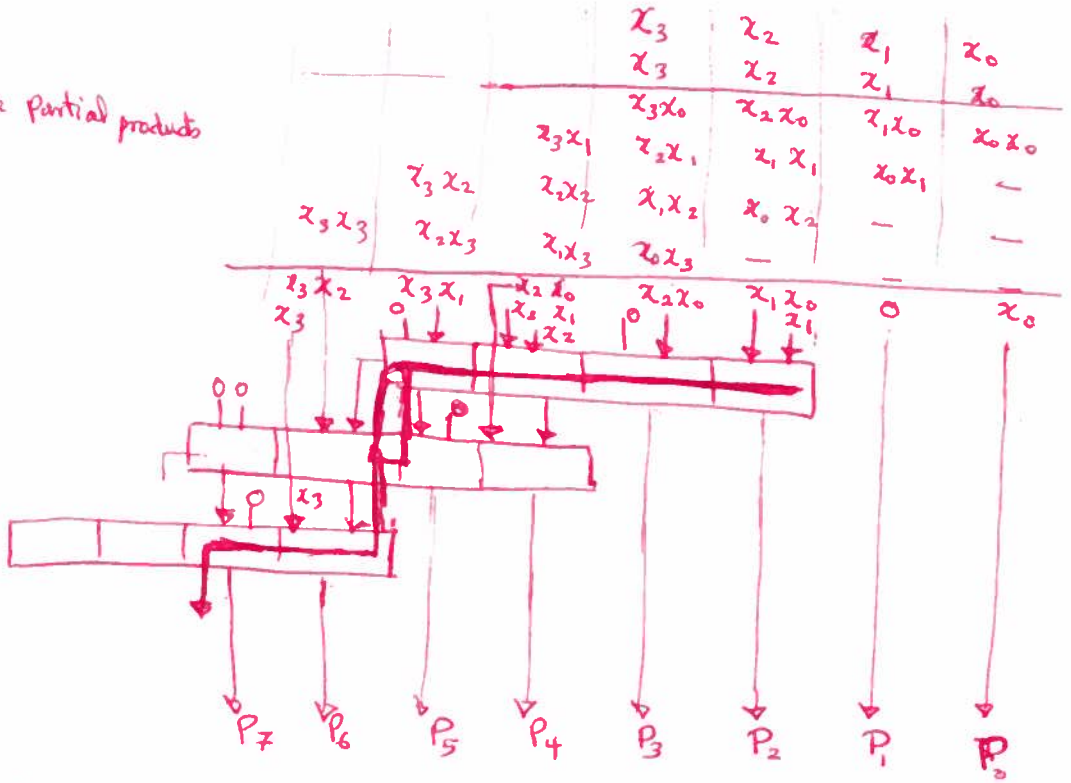
Use  to produce partial products



Delay = 8 FA + 1 AND

If K is a 2' Complant no. then we have to convert the number as follows

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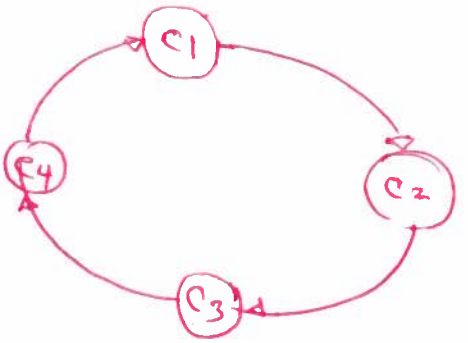
State Diagram:



State Table:

Present State	Next State
C_1	C_2
C_2	C_3
C_3	C_4
C_4	C_1

State Assignment: $C_1 = 00$, $C_2 = 01$, $C_3 = 10$, $C_4 = 11$

Excitation Table:

$y_1 y_0$	$y_1^+ y_0^+$
0 0	0 1
0 1	1 0
1 0	1 1
1 1	0 0

From Table Excitation Vectors can be read directly

$y_1^+ = y_1 \oplus y_0$

$y_0^+ = \bar{y}_0$