BLG 322E – Computer Architecture

Assignment 1

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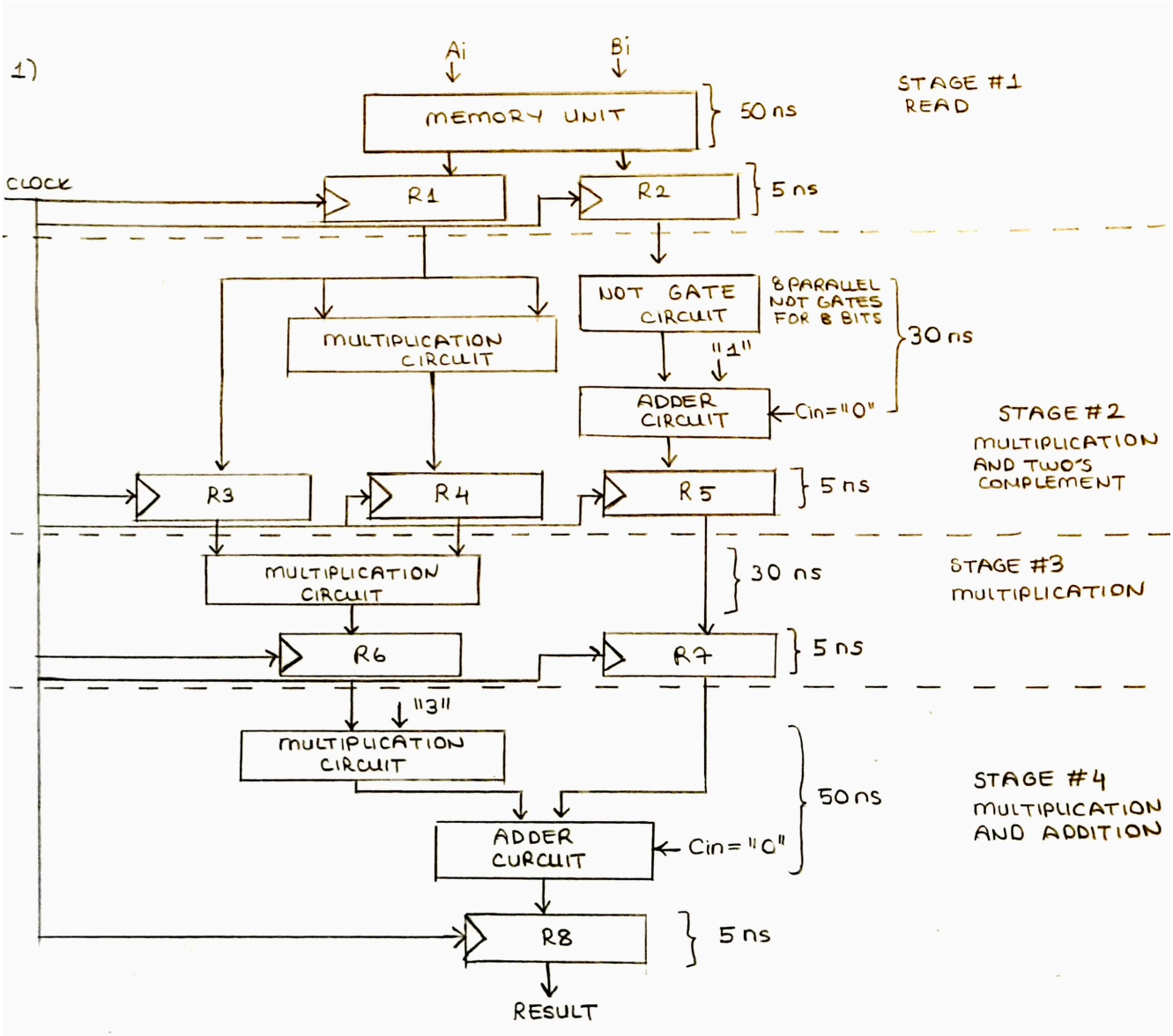
1)



2) $t_p = \max(50, 30, 30, 50) + 5 = 55\,ns$

$t_n = 50ns + 30ns + 30ns + 50ns = 160\,ns$ (without registers)

$K = 4$ stages

i) for $n=5$ elements, $S = \frac{5(160\,ns)}{(4+5-1)(55\,ns)} \approx 1,82$ //

ii) for $n=\infty$, $S_{\lim n\to\infty} = \frac{160\,ns}{55\,ns} \approx 2,90$ //

3) Theoretical maximum speed up is equal to the number of stages.

$S_{max} = 4$ //