BLG 322 / BLG 322E

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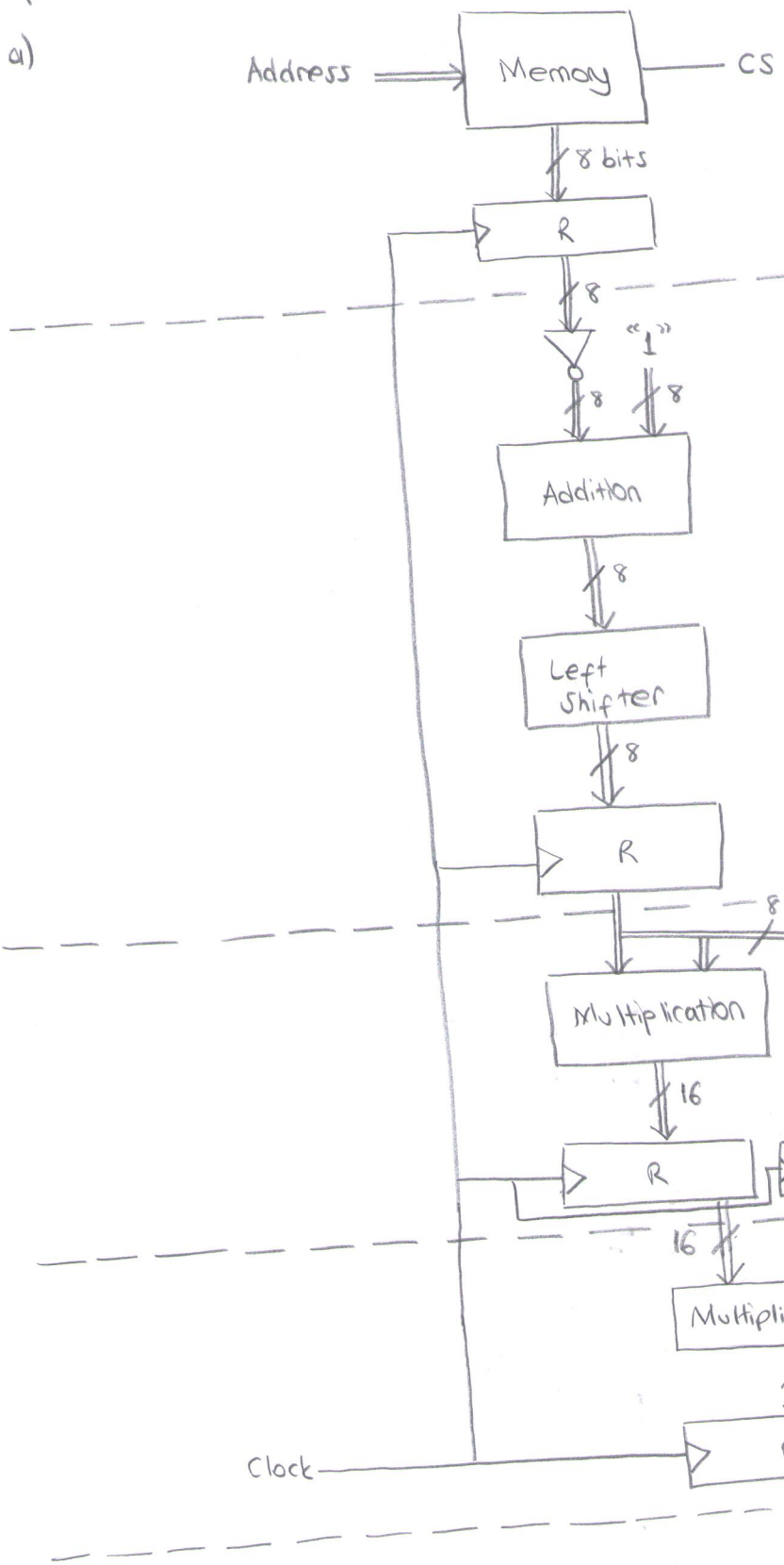
Computer Architecture

Due Date : 01.03.2017

Assignment 1

Solution

a)



Segman 1

Time = 45ns + 5ns

= 50ns

Segman 2

Time = 10ns + 15ns + 10ns + 5ns

= 40ns

Segman 3

Time = 45ns + 5ns

= 50ns

Segman 4

Time = 45ns + 5ns

= 50ns

b) The required time for the slowest segman is 50ns. Thus, the clock cycle should be the same, 50 ns.

without pipeline → $T_n = 45+10+15+10+45+45 = 170$ ns

Execution for 8 numbers with pipeline → $4 \cdot 50 + 7 \cdot 50 = 550$ ns

$\Rightarrow$ speedup = $\frac{8 \cdot 170}{550}$

c) The theoretical speedup = $k = 4$

↓ the number of segmans