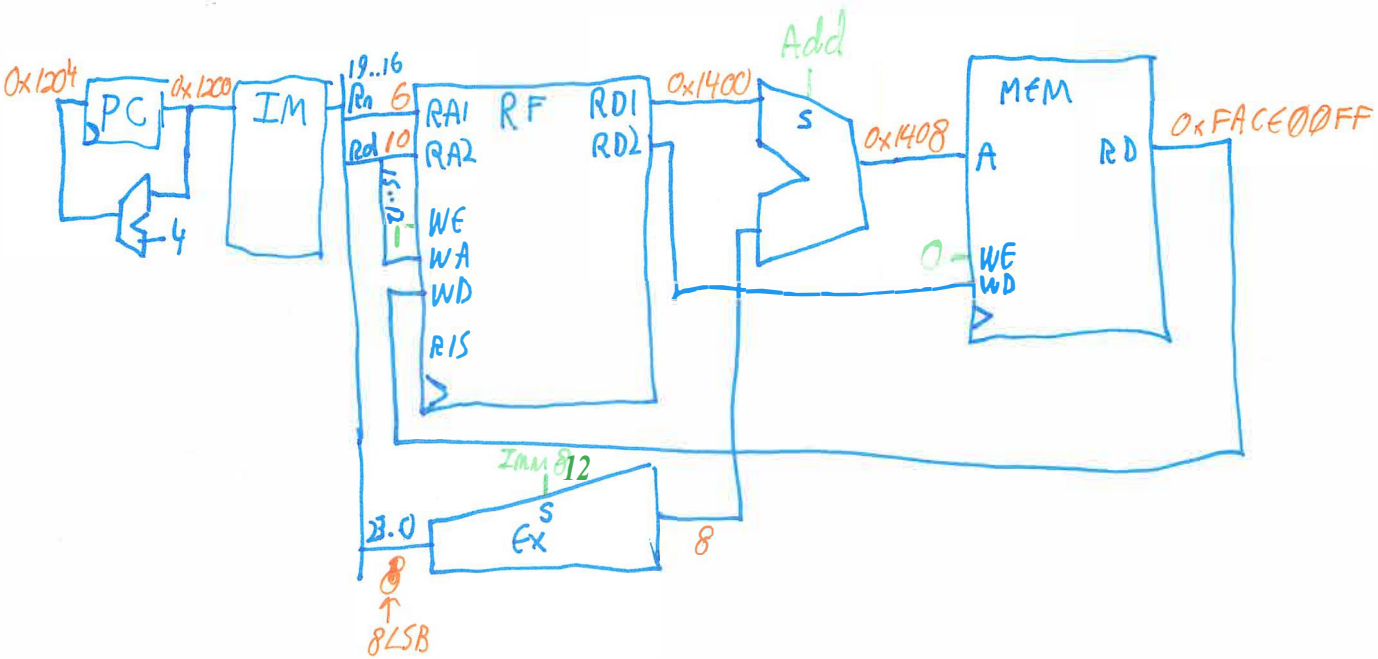
Name Answers

CE-1921-11 – Dr. Durant – Quiz 5
Spring 2017, Week 5

1. (4 points) Draw the ARM single-cycle processor designed in lecture that can execute (just) `ldr` and `str` using (just) (positive) register immediate (e.g., "`[r6,#8]`") addressing mode. Label ~~busses with widths or~~ bit numbers as needed. Include control inputs. Include clock inputs only where needed. You do ***not*** need to include which bits (op, etc.) of the instruction feed to control unit.
2. (2 points) On your drawing above, label all ***data*** paths that are required to successfully complete the instruction `ldr r10,[r6,#8]` located in program memory at `0x1200`. Don't forget the PC-related values. `R6=0x1400`, `Memory[0x1408]=0xFACE00FF`.
3. (2 points) List all the ***control*** signals for your processor above and indicate what their values must be when executing the instruction from the previous problem.
4. (2 points) State the execution time equation. Remember that time is the product of three terms.



(4) $T = IC \times CPI \times T_{clock}$

IC: instruction count

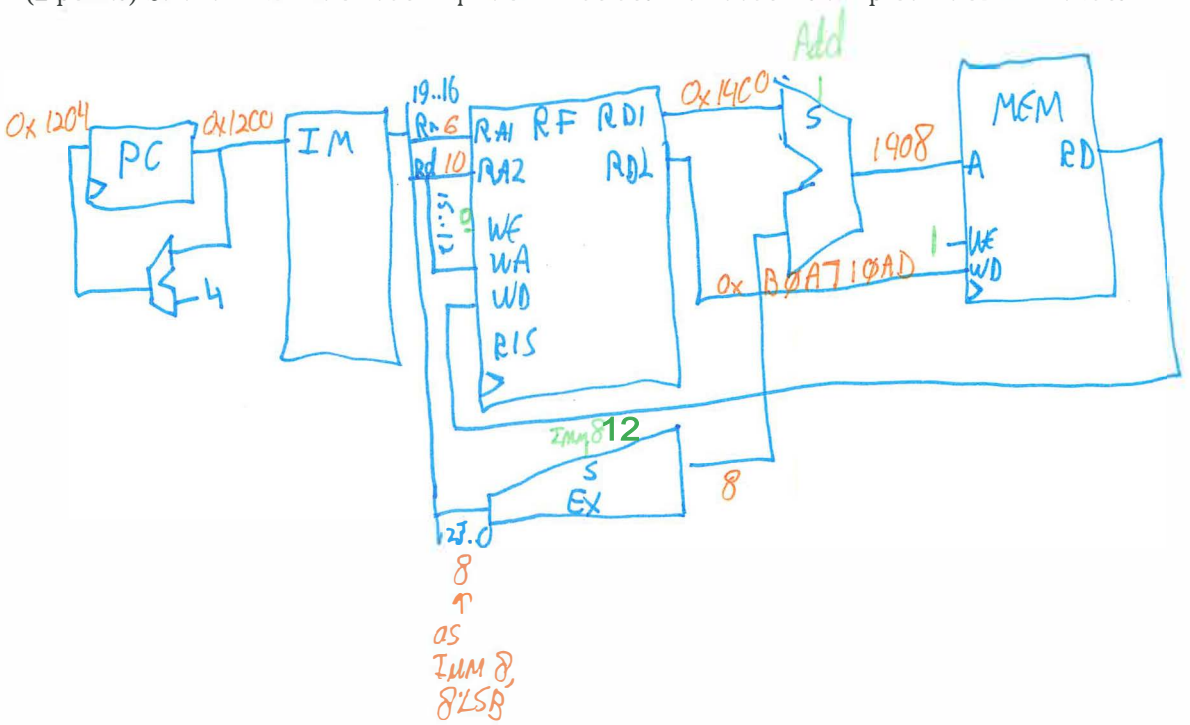
CPI: clocks / instruction

T_{clock}: clock period

Name Answers

CE-1921-21 – Dr. Durant – Quiz 5
Spring 2017, Week 5

1. (~~8~~ 4 points) Draw the ARM single-cycle processor designed in lecture that can execute (just) `ldr` and `str` using (just) (positive) register immediate (e.g., "`[r6,#8]`") addressing mode. Label ~~buses with widths or~~ bit numbers as needed. Include control inputs. Include clock inputs only where needed. You do ***not*** need to include which bits (op, etc.) of the instruction feed to control unit.
2. (2 points) On your drawing above, label all ***data*** path inputs that are required to successfully complete the instruction `str r10,[r6,#8]` located in program memory at `0x1200`. Don't forget the PC-related values. `R6=0x1400`, `R10=0xB0A710AD`.
3. (2 points) List all the ***control*** signals for your processor above and indicate what their values must be when executing the instruction from the previous problem.
4. (2 points) State the execution time equation. Remember that time is the product of three terms.



(4) $T = IC \times CPI \times T_{clock}$

= instruction count
× clocks per instruction
× clock period