1. Assuming this is same as the 5 stage pipeline shown in lecture, what is the shortest clock period this pipeline can run at?

2. What is the shortest clock period for this machine if it wasn’t pipelined?

3. How long would it take to execute 1000 instructions on this pipelined machine? How much faster is that as compared to a non-pipelined machine?
4. For the following sequence of instructions, replace the question marks with the values of the wires assuming the pipeline is fully loaded with sw instruction in the WB stage.

```
lw $3, 6($25)
add $4, $5, $7
and $8, $7, $10
or $9, $6, $13
sw $5, $12,$14
```

5. Identify the data dependencies and hazards in the following set of instructions.

```
sw $3, 4($25)
add $25, $23, $24
sub $26, $24, $25
or $4, $3, $2
lw $4, 12($26)
```