First Name:_____ Last Name: _____

Consider a rising clock edge that causes 3000 to be written into the PC.

1) The 3000 waits at the instruction memory input for the next rising clock edge, at which time the instruction at address 3000 is read out.

○ True

○ False

2) After the address 3000 is read into the PC, the 3000 only propagates to the adder.

○ True

○ False

3) The 3000 waits at the adder input for the next rising clock edge.

○ True

○ False

4) 3001 will be waiting at the PC's input to be written on the next rising clock edge.

○ True

○ False

5) The register file always outputs the two registers' values for the two input read addresses.

○ True

○ False

6) The register file writes to one register on every rising clock edge.

○ True

○ False

7) The design can read from two registers and write to one register during the same clock cycle.

○ True

○ False

8) The programmer must take care not to create a program that writes to a register during the same cycle that the same register is read.

○ True

○ False

9) Consider the MIPS datapath. Find the error in each of the following statements: An R-type instruction like add uses three datapath units: the register file, the ALU, and the data memory.

10) Daw the data path for only *lw rt, d16 (rs)*. Make sure to only use the components that are necessary.

11) Draw the data path for the following assumed instruction. Make sure to only use the components that are necessary.

     swr   rt, rd (rs);   Reg[rt] → Mem [Reg [rd] + Reg [rs]]

12) Draw the data path for the following instruction set:
- *lw rt, d16(rs),*
- *sw rt, d16(rs),*
- *R-type,*
- *bne rs,rt, d16,*
- *swr rt, rd(rs)*