Computer Architecture–Lab Exam - Spring2025
Duration: 90 minutes

Name:	ID:

Design a washing machine controller with four operational states: FILL, WASH, RINSE, and SPIN. The washing machine should adhere to the following timing specifications:

- **FILL:** 3 seconds
- **WASH:** 5 seconds
- **RINSE:** 2 seconds
- **SPIN:** 4 seconds

The controller will utilize a counter to manage these timing intervals, and after completing the SPIN state, the system will return to the FILL state.

System Inputs:

- **Clk:** Connect to the internal oscillator with 20 Hz clock.
- **Active low asynchronous Reset (reset)**
- **Active high Clock Enable (en)**

System Outputs:

LEDs: Four LEDs will represent the current state of the washing machine.

Requirements:

- Write VHDL code which implements the above function
- Write self-check testbench which checks the outputs of washing machine controller [put screenshots for the simulation]

Good Luck

Remember Education is permanent, Grades are Temporary