Important: This is an open book test. You can use any books, notes, or paper, but not exchange anything with other students. You are not allowed to use any electronic/communication devices, including a calculator. Do not log into the computer during the test. Any calculations and rough work can be done on the back side of the test pages. You will lose five points for not writing your name.

1. [8 pt] Distinguish between the resource allocator and virtual machine views of the operating systems. Which parts of Unix and Windows correspond to these parts?

2. [8 pt] What is the difference between SIMD and SMP? Which of these two requires the use of multiple CPUs? Is either of them essential for cluster computing?

3. [5 pt] What is cascading process termination? How do you prevent that in Unix systems that support it?
4. [5 pt] Give arguments in favor of and against the transition of process state from **Blocked/Suspended** to **Blocked**.

5. [5 pt] Does the bakery algorithm to solve critical section problem guarantee bounded wait condition. Explain your yes or no answer.
6. [6 pt] Differentiate between multiprogramming, multiprocessing, and multitasking operating systems?

7. [6 pt] In the multiple process solution (solution 4 in notes), we have a do-while loop in entry section that is controlled by the statement

\[
\text{do} \\
\text{...} \\
\text{while ( j < n ) || ( turn != i && flag[turn] != idle );}
\]

What is the effect if we remove the testing of condition turn != i from this loop control?