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. Switch off your cell phones. 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. [6 pt] The use of `exec1` system call changes the program while retaining the process. Explain how it is achieved.

2. [6 pt] The current generation of processors from different vendors are billed as multi-core CPUs. Will you classify them as SIMD, MIMD, or SMP processors? Briefly explain your answer.
3. [6 pt] We say that the kernel protects the system from a user. What is it that the kernel is trying to protect? Why is it important for the operation of the system?

4. [6 pt] Briefly describe the operation of handshaking protocol.

5. [6 pt] How does the operating system acquire control from user process to perform a process switch. Describe all possibilities.
6. [6 pt] What is the difference between daemons and zombies in Unix? Is any of them essential to the working of the system?

7. [6 pt] Explain the difference between a general counting semaphore and a condition used to implement monitors.