

Student Name: _____ Student ID # _____

UOSA Statement of Academic Integrity

On my honor I affirm that I have neither given nor received inappropriate aid in the completion of this exercise.

Signature: _____ Date: _____

Notes Regarding this Examination

Open Book(s) You may consult any printed textbooks in your immediate possession during the course of this examination.

Open Notes You may consult any printed notes in your immediate possession during the course of this examination.

No Electronic Devices Permitted You may not use any electronic devices during the course of this examination, including but not limited to calculators, computers, and cellular phones. All electronic devices in the student's possession must be turned off and placed out of sight (for example, in the student's own pocket or backpack) for the duration of the examination.

Violations Copying another's work, or possession of electronic computing or communication devices in the testing area, is cheating and grounds for penalties in accordance with school policies.

Question 1: Signals & Projects (10 points)

A. List a project from this course to which signals were delivered and name the corresponding signal type.

B. *Explain* how your program dealt with the signal.

C. *Explain* an alternate approach that your program could have used to deal with the signal.

Question 2: IPC & Security (40 points)

A. Rank the following communication channels from most accessible to least accessible: pipes, FIFOs, TCP sockets, UDP sockets. *Justify* your ranking.

1. Most accessible.

2. Second most accessible.

3. Third most accessible.

4. Least accessible.

B. Rank the following communication channels from most secure to least secure: pipes, FIFOs, TCP sockets, UDP sockets. *Justify* your ranking.

1. Most secure.

2. Second most secure.

3. Third most secure.

4. Least secure.

C. In general, describe the relationship between accessibility and security for IPC. *Explain* why this relationship exists.

Question 3: IPC & Abstractions (10 points)

A. *Explain* one example of *horizontal* abstraction provided by one of the IPC mechanisms we covered in this course.

B. *Explain* one example of *vertical* abstraction provided by one of the IPC mechanisms we covered in this course.

Question 4: Memory Management (30 points)

A. List two additions to computer hardware that together allow for efficient relocation of processes within main memory. *Explain* how these two pieces of hardware are used in conjunction with one another for this purpose.

B. List one addition to computer hardware that helps to ensure security between applications when processes are relocated within main memory. *Explain* how this piece of hardware is used for this purpose.

Question 5: Deadlock (10 points)

A. *Explain* one advantage of *deadlock avoidance* over *deadlock detection and recovery*.

B. *Explain* one advantage of *deadlock detection and recovery* over *deadlock avoidance*.