CS 314-002 Operating Systems  
Spring 2020  
Quiz #1 on January 21, 2020 (SOLUTIONS)

Your Last Three Digits: ________________  
(please do NOT write all of your student ID or your name)

Grade: ______

******************************************************************************

(1) What are the two primary roles of operating systems?

- Operating systems as middlemen between high-level commands (human users or user applications) or operating systems as extended machines (+5 points)
- Operating systems as government for system resources in a computer systems or operating systems as resource managers (+5 points)

(2) What is “context switching”?

Context-switching is the act of switching a processor from one (currently running) program to another.

(3) What is “extended machine”? This question does not ask how we can use extended machine. A definition of “extended machine” is needed.

An imaginary computer (as a hardware computer) that can be manipulated directly by high-level user commands by abstraction offered by an operating system.
(4) What problem in “batch system” do “multi-programming (multitasking) OSes” fix and how?

The problem multitasking OSes fix is “low processor utilization*”.

*: Since batch systems execute one program at a time, its processor utilization is usually low (as we discussed in the classroom).

Note: “the capability to fix bugs after a program crashes by a software bus” is not the problem “multitasking OS” fixes. It is the problem “timesharing systems (timesharing multitasking OSes) fix.

(5) What does “high level commands” mean (in computer science in general)? What does “low level commands” mean?

High-level commands:
- Easy-to-understand (easy to human) commands similar to human language (English).
- Commands that describes “what you want”

Low-level commands:
- Hard-to-understand to human, but easy to understand (and execute) by computer hardware
- Commands that describes” how what you want should be executed”