List of the HW Quiz #1 Questions

There are two types of the questions in this question list:

(1) Those that are specified as “REQUIRED” are supposed to be answered and submitted by each of you by the due.

(2) Those questions that are NOT specified as REQUIRED are not required for submission by the submission due, but will be covered in the exam (midterm exam).

Note: Solutions should be prepared based on (a) the PPT slides posted to the course home and/or (b) the contents in the required textbook. Please do not use web sites available in the Internet (because the contents in some web sites in the Internet, even those in Google are sometime not correct)

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

#2 (REQUIRED): What are the typical three structural layers in a computer system?

#3: Why are operating systems supposed to perform the role of “middleman”? Explain the reason by mentioning at least one example.

#4: Why are operating systems supposed to perform the role of “government”? Explain the reason by mentioning at least one example.

#5: What is another way of saying “middleman”?

#6: What is another way of saying “government”?

#7: What particular problem was caused by a problem in the process management of an operating system in the past (mention the incident that was known to be caused by a problem in the process management in an operating system)?

#8: What particular problem was caused by “race condition bug” in the past (mention the incident that was known to be caused by “race condition bug”)?

#9: What particular problem was caused by some issues in a real-time OS in the past (mention the incident that was known to be caused by some issue in a real-time OS)?
#10 (REQUIRED): What is “extended machine”? This question does not ask how we can use extended machine. A definition of “extended machine” is needed.

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

#12 (REQUIRED): What are “multitasking systems”? Note: a precise definition of “multitasking systems” is needed (e.g., “computer systems that run multiple processes (programs) at a time” is not good enough for CS majors – more technical details should be attached).

#13: What is “context switching”?

#14 (REQUIRED): What was the primary disadvantage and advantage in “Pre Operating System (no OS)”? Mention at least (primary) one for each of the primary disadvantage and advantage.

#15 (REQUIRED): What is “batch system”? Show how a computer host with a typical batch is organized.

#16 (REQUIRED): Briefly describe what problem in “pre operating system” a batch system fixes and how.

#17 (REQUIRED): What are the two primary problems in batch system?

#18 (REQUIRED): What problem in “batch system” do “multi-programming (multitasking) OSes” fix and how?

#19 (REQUIRED): What problem in “multi-programming (multitasking) OSes” do “multitasking timesharing OSes” fix and how?

#20: Look up the meaning of the following word using your textbook: “degree of multitasking”.

#21: What is “process”?

#22: (REQUIRED): Describe how processes differ from programs by mentioning at least three differences between them.

#23: What does “PCB” stand for? Why do operating systems need PCB?

#24: Mention at least five different information contained in a PCB (you do not have to describe them).

#25: What is “monolithic structure OS” (define the one)? Mention at least one primary advantage and disadvantage.
#26: What is “layered (or modularized) structure OS” (define the one)? Mention at least one primary advantage and disadvantage.

#27 (REQUIRED): What is “Virtual Machine” (define the concept)?

#28: What is the primary motivation(s) to use VM’s?

#29: Sketch how VM is implemented in memory.

#30: Look up the meaning of the following word using your textbook: “OS kernel”.

#31: Many operating systems use “external commands”. What are they? What is the primary reason to adopt them? What is the primary difference between “external commands” and “micro-kernel architecture”?

#32 (REQUIRED): Describe how “micro-kernel architecture” and “non micro-kernel architecture” are different in how system calls issued by user applications will be executed.

#33 (REQUIRED): What are the advantages in using “micro-kernel architecture”? What is the primary disadvantage in “micro-kernel architecture”? 