50.005 Quiz OS 2 (15 mins)
Name: _**Sample Solutions**_____ Student ID: _____

Note: During the quiz, you can consult written or printed materials. But you can't go online or look at anything electronic, including your laptop, smartphone, etc.

1. _**Context switching [2pts]**_____ involves saving the execution state of a process and restoring the saved execution state of another process. It is a key *mechanism* that allows the kernel to switch the use of the CPU among different processes. Among all the ready processes, which process the kernel selects to next use the CPU at a scheduling point is a question of __**policy [2pts]**_____ (in contrast to mechanism).

2. What is contained in the text section of a process's address space?

Executable code [2pts]

Alternative answers: program, instructions, etc.

3. Use *one word* to complete the following sentence. A process is usually protected from bugs present in another process because the user address spaces of two processes are by default __**disjoint [2pts]**_____ .
Accept similar one-word answers, e.g., separate, private, distinct, etc. Deduct 1pt if answer expresses similar idea but has more than one word.

4. Discuss why a *microkernel* design can improve the reliability of an operating system compared with the Unix design in which all the OS subsystems run inside the kernel.

If an OS subsystem in the Unix kernel is buggy, it can corrupt another OS subsystem (because kernel code has unrestricted access privileges). On the other hand, a microkernel runs different OS subsystems as separate user processes, which are protected from one another by default. [3pts]

2pts for explaining the essence of microkernel design from reliability viewpoint. 1pt for contrasting it with the Unix design.