CSci 402 - Operating Systems

Quiz 7

Fall 2023

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(This exam is open book and open notes.
Remember what you have promised when you signed your
Academic Integrity Honor Code Pledge.)

Time: (N/A) minutes

_____-
Name (please print)

Total: 10 points

_____-
Signature

Instructions

1. This is the first page of your exam. The previous page is a title page and does not have a page number. Since this is a take-home exam, no need to sign above since you won't submit this file.
2. Read problem descriptions carefully. You may not receive any credit if you answer the wrong question. Furthermore, if a problem says *"in N words or less"*, use that as a hint that N words or less are expected in the answer (your answer can be longer if you want). Please note that points may get *deducted* if you put in wrong stuff in your answer.
3. If a question doesn't say `weenix`, please do not give `weenix`-specific answers.
4. Write answers to all problems in the **answers text file**.
5. For non-multiple-choice and non-fill-in-the blank questions, please show all work (if applicable and appropriate). If you cannot finish a problem, your written work may help us to give you partial credit. We may not give full credit for answers only (i.e., for answers that do not show any work). Grading can only be based on what you wrote and cannot be based on what's on your mind when you wrote your answers.
6. Please do *not* just draw pictures to answer questions (unless you are specifically asked to draw pictures). Pictures will not be considered for grading unless they are clearly explained with words, equations, and/or formulas. It's very difficult to draw pictures in a text file and you are not permitted to submit additional files other than the answers text file.
7. For problems that have multiple parts, please clearly *label* which part you are providing answers for.
8. Please ignore minor spelling and grammatical errors. They do not make an answer invalid or incorrect.
9. During the exam, please only ask questions to *clarify* problems. Questions such as "would it be okay if I answer it this way" will not be answered (unless it can be answered to the whole class). Also, you are suppose to know the definitions and abbreviations/acronyms of *all technical terms*. We cannot "clarify" them for you. We also will **not** answer any clarification-type question for multiple choice problems since that would often give answers away.
10. Unless otherwise specified and stated explicitly, multiple choice questions have one or more correct answers. You will get points for selecting correct ones and you will lose points for selecting wrong ones.
11. When we grade your exam, we must assume that you wrote what you meant and you meant what you wrote. So, please write your answers accordingly.

(Q1) (2 points) Which of the following statements are correct about **Kernel 2**?

(1) "vnode.c" contains VFS code for pathname resolution
(2) "main.c" contains VFS code for reading from some devices
(3) "vfs_syscall.c" contains VFS code for creating I/O devices
(4) "namev.c" contains VFS code for supporting system calls
(5) none of the above is a correct answer

Answer (just give numbers): _____

(Q2) (2 points) Which of the following statements are correct about **deferred work**?

(1) user thread preemption can be implemented as deferred work while kernel thread preemption cannot be implemented as deferred work
(2) when an interrupt service routine is interrupted by a higher level interrupt, the context of the first interrupt service routine is saved in an interrupt stack
(3) on Windows, clock interrupt has higher priority than keyboard interrupt
(4) when an interrupt service routine is finished, you must switch back to a thread context
(5) none of the above is a correct answer

Answer (just give numbers): _____

(Q3) (2 points) Which of the following statements are correct about a **Unix file system**?

(1) a directory is implemented as a text file
(2) an inode contains mapping from an inode number to a disk address
(3) a directory entry maps an inode number to a file name
(4) pathname resolution is completely done inside the AFS (Actual File System)
(5) none of the above is a correct answer

Answer (just give numbers): _____

(Q4) (2 points) Which of the following statements are correct about a **S5FS**?

(1) in S5FS, each node on the free list can keep up to 100 disk block pointers
(2) in S5FS, some inodes are stored inside the boot block
(3) in S5FS, part of the super block is the inode cache
(4) in S5FS, the free list is a doubly-linked circular list
(5) none of the above is a correct answer

Answer (just give numbers): _____

(Q5) (2 points) Which of the following statements are correct about **virtual memory**?

(1) kernel code would use physical address to talk to I/O devices
(2) kernel code would use physical address to access physical memory
(3) if the MMU uses base and bounds registers, the base register contains a virtual address
(4) if the MMU uses base and bounds registers, the bounds register contains a physical address
(5) none of the above is a correct answer

Answer (just give numbers): _____