# Operating System Quiz 3

Name: Student ID:

1. In an Intel PC architecture, the Master Boot Record (MBR): contains code that…

(a) Loads the operating system.

(b) Loads the system BIOS.

(c) Loads the Volume Boot Record (VBR).

(d) Allows the user to choose which operating system to load.

1. Suppose File B is a link file of File A. If process P1 opens A twice and process P2 opens B twice, how many dentry and inode objects are maintained in the memory?

A. 1,1 B. 2,2 C. 4,4 D. 4,2

1. When a process is first launched, the operating system does not know the size of this segment:

(a) text

(b) data

(c) bss

(d) heap

1. What information is stored in a thread control block (TCB)?

(a) List of open files.

(b) Stack pointer.

(c) Memory map.

(d) Thread owner ID

1. A file system uses a two-level indexed allocation scheme. If the size of each block is 1KB, and the block address is 4 bytes, then the maximum length of a file this system can support is approximately \_\_\_\_\_ .

A. 16MB B. 64MB C. 128MB D. 256MB

1. A disk drive using the Circular LOOK (C-LOOK) algorithm just wrote block 2016 and then read block 2017. The following blocks are queued for I/O: 1900, 2200, 1800, 2500. In what order will they be scheduled?

A. 2200, 1900, 1800, 2500 B. 2200, 1900, 2500, 1800

C. 1800, 2500, 2200, 1900 D. 2200, 2500, 1800, 1900

1. Differing from a soft deadline, a hard deadline:
2. Is one where it is difficult to predict when the thread will exit.
3. Applies to periodic (nonterminating) rather than terminating processes.
4. Is one where there is no value to the computation if the deadline is missed.
5. Is one where it is difficult to predict when the CPU burst period will end
6. A disk system uses the SSTF scheduling algorithm to manage the disk arm movement. Suppose there is a disk request queue with requests on cylinder 27, 136, 58, 100, 72, 40 in order, and the current disk head is at cylinder 80. Then the total head movement is \_\_\_\_\_ cylinders.

A. 80 B. 136 C. 167 D. 162

1. In Linux system, the file directory /proc is used to

A.maintain device info B. commands of operating system

C.configure files of the system D. information of process and system

1. All of the following are on-disk filesystem data structures except
2. inodes.
3. data blocks.
4. the superblock.
5. vnodes.
6. The superblock in a Linux file system is important because:

(a) it holds all of the inodes

(b) it contains all file system configuration parameters

(c) it is owned by the superuser

(d) it is owned by the superintendent

1. A typical Linux file system uses:

(a) contiguous space allocation for all files in the file system

(b) a direct indexed approach for storing file data blocks

(c) an indirect indexed approach for storing file data blocks

(d) a combination of both (b) and (c)

1. If a process has allocated every 1024th virtual page (e.g. it has allocated virtual pages 0, 1024, 2048, 3072, 4096, 5120 ... 1024000), which one of the following page table schemes will use the LEAST amount of memory?

(a) A flat page table

(b) A two-level page table with 1024 first level entries

(c) A two-level page table with 2048 first level entries

(d) An inverted page table

1. Which of the following does NOT solve deadlock?

(a) Acquiring all resources before using any of them

(b) Only acquiring resources in order based on a predetermined priority

(c) Acquiring a maximum of one resource at a time

(d) If a resource is unavailable, releasing all resources and waiting for all required resources to become available

1. Which of the following is not a solution to thrashing?
2. Running fewer processes
3. Increasing the speed of the CPU
4. Increasing the size of physical memory
5. Rewriting programs to have better locality
6. Which of the following is an example of external fragmentation?

(a) A malloc’ed block needs to be padded for alignment purposes.

(b) A user writes data to a part of the heap that isn’t the payload of a malloc’ed block.

(c) There are many disjoint free blocks in the heap.

(d) A user malloc’s some heap space and never frees it.

1. To mount a usb device located at /dev/sdb to /mnt/usb, suppose the file format is fat32. Which of the following shell scripts is correct?

A． mount –t vfat /dev/sdb /mnt/usb

B． mount –t fat32 /dev/sdb /mnt/usb

C． mount –t vfat /mnt/usb

D. mount –t fat32 /mnt/usb

1. Which of the following statements about log structured file system are Incorrect?
2. Log structured file systems perform much better on random writes than random reads
3. When the system is down, the log structured file system does not need recovery
4. It normally supports the “append” operation instead of the in-place update
5. In database, data should be first written into log files before performing the real updates
6. For a file x, suppose both process A and B apply the memory map strategy to map x to memory. Which of the following statements are True?
7. x will be mapped to the same logical memory address for A and B
8. x will be replicated into two copies for A and B
9. Updates for x will be seen by both A and B
10. If A close x, B will not see x (x closes) as well.
11. Moving from a single hard drive to using RAID can obtain which performance benefits?
12. Raid 1 achieves a better data reliability than raid 2, 3 and 4.
13. Raid 4 is more efficient than raid 3 for reading large data block
14. Raid 6 incurs higher storage overhead than raid 5
15. All of the above
16. Suppose we are trying to manage 128kb kernel memory and the request are: allocate 18kb, allocate 40kb, release 18kb, allocate 30kb. So the free memory will be like:

(a) 16kb, 32kb

(b) 32kb

(c) 64kb

(d) 32kb, 166kb

1. For disk scheduling algorithm, which of the following statements are Incorrect?

(a) SJF normally performs better than FIFO

(b) All algorithms only consider the seek costs

(c) The same technique, e.g., Elevator Algorithm, can be applied to SSD

(d) Which algorithm performs better depends on the real workload

1. Suppose we have a disk cluster with 8 equal-size disks. And we can select raid 0, raid 1 or raid 5 for the cluster. For each level, what is the minimum number of disks that may fail before data may be lost?

A. 1, 1, 1 B. 1, 1, 2 C. 1, 2, 2 D. 2, 2, 2

1. When we use DMA to handle I/Os, which of the following statements is Incorrect?
2. Cache coherency must be preserved
3. CPU does not need to check the status register of I/O devices in a busy loop
4. Both CPU and DMA can access the data read into memory concurrently
5. DMA can work in a CPU-stealing and bursting mode.

For the next 2 questions, assume that: In the i-node of a file there are 10 direct pointers, 1 indirect indexed pointer and 1 double indirect indexed pointer, the block size is 1KB. Each indexed pointer is 4 bytes. If the file's i-node is already in memory.

1. In order to read the data at the offset 1234 into memory, how many disk blocks are required to access?

A. 1 B. 2 C. 3 D. 4

1. In order to read the data at the offset 307400 into memory, how many disk blocks are required to access?

A. 1 B. 2 C. 3 D. 4

1. On some computer, the clock interrupt handler needs 2 msec (including context switch

overhead) per clock tick to execute, and the clock runs at 75 Hz. What fraction of the CPU time is devoted to the clock?

1. 10% (b)15% (c)20% (d)25%
2. In a file system, the basic operation in a “Open” system call is \_\_\_\_\_\_\_\_\_

A. reading file contents from outer storage into memory

B. reading file control information from outer storage into memory

C. reading file’s FAT table from outer storage into memory

D. reading disk block from disk into memory