# 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. When does preemption take place?

(a) When a quantum expires.

(b) When a process issues an I/O request. 为什么不是B?

(c) When a process exits.

(d) All of the above.

1. With DMA (Direct Memory Access):

(a) The processor can read or write directly to a device.

(b) The kernel can read or write directly to a process’ memory without intermediate buffers.

(c) A process can read or write to kernel memory without intermediate buffers.

(d) The device can read or write directly to the system’s memory

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 compare-and-swap instruction (CAS, or CMPXCHG on Intel systems) allows you to:

(a) Modify a memory location only if its contents match a given value.

(b) Exchange the contents of two memory locations if their values are different.

(c) Exchange the contents of two memory locations if a lock is not set.

(d) Exchange the contents of two memory locations if a lock is set.

1. A quantum is:

(a) The absolute minimum time that a process can run. 为啥不是A

(b) The maximum time that a process can run before being preempted.

(c) The amount of time that a process runs before it blocks on I/O.

(d) The fraction of a time slice during which the process is running

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 multilevel feedback queue scheduler generally assigns a long quantum to:

(a) High priority processes.

(b) Low priority processes.

(c) New processes.

(d) Old processes.

1. Which scheduler relies on predicting the next CPU burst based on an average of previous bursts?

(a) First-come, first served.

(b) Round robin

(c) Shortest remaining time first. 不是D

(d) Multilevel feedback queues

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 为啥不是 C

(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. In a system employing a segmentation scheme for memory management, a process is divided into:
2. One segment per thread
3. A number of segments which must be of equal size
4. A number of segments which need not be of equal size 段不定长
5. None of the above
6. Which of the following statements about log structured file system are Incorrect?
7. Log structured file systems perform much better on random writes than random reads
8. When the system is down, the log structured file system does not need recovery
9. It normally supports the “append” operation instead of the in-place update
10. In database, data should be first written into log files before performing the real updates
11. 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?
12. x will be mapped to the same logical memory address for A and B
13. x will be replicated into two copies for A and B
14. Updates for x will be seen by both A and B
15. If A close x, B will not see x (x closes) as well.
16. Moving from a single hard drive to using RAID can obtain which performance benefits?
17. Raid 1 achieves a better data reliability than raid 2, 3 and 4.
18. Raid 4 is more efficient than raid 3 for reading large data block
19. Raid 6 incurs higher storage overhead than raid 5
20. All of the above
21. 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. In a paging system, which statement about paging strategy is Incorrect?

(a) The size of an inverted page table grows with the size of the virtual address space that it is supporting 错误的, 不可以增长因为物理内存是固定的.

(b) Two-level paging normally reduces the storage overhead compared to one-level paging 对

(c) Hash-based paging sometimes requires more memory accesses due to hash collision 对

(d) Hash paging can be used together with inverted paging 对

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.
6. If the system is slowed down by thrashing, by which means we can improve the performance?
7. Increase the size of physical memory
8. Reduce the number of concurrent processes
9. Using a better scheduling algorithm to intersect the running of I/O bound and CPU bound processes
10. All of the above
11. 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%