Questions for Input-Output

Which of the following statements about the Linux I/O is correct?
    A. Applications need to use different virtual file system APIs to access different I/O devices.
    B. Devices can have their own ways to implement file system API.
    C. The Linux file system API cannot be used for network communication.

If you are an engineer developing a device driver in a high-level language like C, why would you prefer memory-mapped I/O?

A. Memory-mapped I/O is much faster than port-mapped I/O
B. Port-mapped I/O doesn't support high-level language as it needs special assembly instructions
C. Memory-mapped I/O doesn't need support of memory management unit

If an external device such as a printer runs much slower than the CPU, which mechanism should the driver use to increase efficiency?

A.   busy-wait
B.   interrupt

Which of the following statements about the DMA is incorrect?

    A. DMA is a hardware core inside CPU
    B. CPU is not involved in the data transfer until it receives a hardware interrupt
    C. Multiple device controllers can share the same DMA

Which of the following statement(s) about device drivers are correct? Select all that apply.
    A. Device driver is implemented in the firmware of the external device
    B. Device drivers can come prepackaged with the OS or be installed dynamically.
    C. Device driver starts I/O operation and blocks until the interrupt handler unblocks it when I/O completes.
    D. Device driver unblocks the user process that calls the I/O system call when I/O completes.

Which of the following statement(s) about devices is(are) true? Select all that apply.

 A. With the help of Linux file system API, we can map every device into a file name, and access it as a file on the disk.
 B. User processes can directly configure devices using ioctl system call.
 C. The scheduling of I/O devices is the same as the scheduling of the CPU.

Which of the following statements about the disk partition is correct?

    A. Each partition contains its own partition table.
    B. If we want to run both Ubuntu and Windows on our laptop, we need to break up the disk drive into multiple partitions.
    C. Each partition has a boot block, from which we can get information about the entire drive.

What is the advantage of linked list allocation compared to contiguous allocation?

    A. Linked list allocation doesn't cause external fragmentation.
    B. Linked list allocation provides faster random access.
    C. Linked list allocation makes sure that the content of one file is stored in sequential physical blocks.

Which of the following statements about the FAT technique is correct? Select all possible answers.

    A. FAT is loaded into the main memory whenever we boot up the operating system.
    B. FAT is a technique to address the issue that linked list allocation is slow for random access.
    C. One of the drawbacks of FAT is that when the disk gets large, the FAT table may be too big to fit in memory.

Which of the following statements about i-nodes is correct? Select all possible answers.

    A. The memory requirement is far less than FAT, because we only need to load i-nodes of open files in memory.
    B. For i-nodes design, both small and big file accesses are fast.
    C. We need more disk I/O if we want to fetch content at the end of a big file, which uses triple indirect block.

Which of the following statements about directories is correct?

    A. A directory entry contains information such as the file name and the address of the first block of the file.
    B. Directories are stored as special blocks in the file system.
    C. We can use the in-line approach to store long file names on the heap.

Which of the following statements about links is correct? Select all possible answers.

    A. Links are used for sharing files between different users or creating shortcuts.
    B. In hard links, we maintain two separate i-nodes if there are two different paths to the same file.
    C. In soft links, we can delete the i-node for the actual file even if there is another i-node of type LINK containing its path.

Which of the following statements about the caching is correct? Select all possible answers.

    A. Caching reduces the chance that the operating system is blocked by the disk I/O.
    B. Caching would cause an inconsistent state between content in the main memory and on the disk.
    C. Caching with write though will reduce the performance of both read and write.

Which of the following statements about the logical dump is correct? Select all possible answers.

    A. In a logical dump, we copy physically block by block from one disk to another.
    B. In a logical dump, we can copy files between different operating systems.
    C. In a logical dump, we need to copy all the modified directories as well as the files themselves.

Based on the blocks in use list and free blocks list below, what kind of consistency issue does the file system have?

Index	0	1	2	3	4	5	6
Blocks in use	1	1	1	0	1	0	1
Free blocks	0	0	0	1	0	0	0

A.   Missing block
B.   Duplicate block in free list
C.   Duplicate data block

Is the following statement true or false?

The CD-ROM uses contiguous allocation scheme for storing files.
A.   True
B.   False

Is the following statement true or false?

The linked-list file allocation scheme results in no external fragmentation.
A.   True
B.   False

Is the following statement true or false?

A logical dump always dumps all directories even if they are unmodified.
A.   True
B.   False

Is the following statement true or false?

In UNIX, cached i-node blocks are updated using write-through caching techniques.
A.   True
B.   False

Is the following statement true or false?

DMA provides direct access between memory and an I/O device.
A.   True
B.   False

Is the following statement true or false?

Directory entries are stored in inodes.
A.   True
B.   False

Is the following statement true or false?

The boot block is used to load the OS into kernel space.
A.   True
B.   False