

# 文件和大存储

6. A file's absolute path name starts from\_\_\_\_\_ .

单选题 (4 分) 4 分

- ☐ A. current directory
- ☒ B. root directory
- ☐ C. home directory
- ☐ D. multi-level directory

7. Commonly, In memory the file control block of a file does not contain\_\_\_\_\_.

单选题 (4 分) 4 分

- ☒ A. the access rights
- ☐ B. the timestamp
- ☐ C. the file size
- ☒ D. the file name

10. The system design the structure File Control Block (FCB) to manage the files. Commonly, File control block is created on disk when the \_\_\_\_\_ system call is invoked.

单选题 (4 分) 4 分

- ☐ A. fork
- ☒ B. open
- ☐ C. read
- ☐ D. write

要注意FCB在disk和在主存里 (这个没见过)

6. \_\_\_\_\_ present a uniform device-accessinterface to the I/O subsystem, much as system calls provide a standardinterface between the application and the operating system.

单选题 (9 分) 9 分

- ☐ A. Kernel
- ☒ B. Device drivers
- ☐ C. Bus
- ☐ D. Operating system

#### 4. Which kind of swap space is fastest?

单选题 (9 分) 9 分

- ☐ A. A swap file on FAT
- ☐ B. A swap file on ext3
- ☐ C. A partition with sophisticated file system functions
- ☒ D. A raw partition

- a. The FCFS schedule is 143, 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. The total seek distance is 7081.  
b. The SSTF schedule is 143, 130, 86, 913, 948, 1022, 1470, 1509, 1750, 1774. The total seek distance is 1745.  
c. The SCAN schedule is 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 4999, 130, 86. The total seek distance is 9769.  
d. The LOOK schedule is 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 130, 86. The total seek distance is 3319.  
e. The C-SCAN schedule is 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 4999, 86, 130. The total seek distance is 9985.  
f. The C-LOOK schedule is 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 86, 130. The total seek distance is 3363.

这里主要的是LOOK算法，它回的时候是不会到边界的，就算是C-look也是回到另一边最末尾然后再按照原顺序跑

#### 8. Contiguous allocation of files is not good for files that change in size because:

单选题 (6 分) 6 分

- ☐ A. random access time is too slow.
- ☐ B. it is slow to move backwards in the file.
- ☒ C. the files need to be moved around when they grow in size.
- ☐ D. the files cannot be made smaller.

正确答案: C

#### 9. 某文件系统采用索引节点存放文件的属性和地址信息，簇大小为 4KB。每个文件索引节点占 64B，有 11 个地址项，其中直接地址项 8 个，一级、二级和三级间接地址项各 1 个，每个地址项长度为 4B。请回答下列问题。

- (1) 该文件系统能支持的最大文件长度是多少? ① KB+ ② MB+ ③ GB+ ④ TB (空格内填写数字)  
(2) 文件系统用 1M ( $1M=2^{20}$ ) 个簇存放文件索引节点，用 512M 个簇存放文件数据。若一个图像文件的大小为 8000B，则该文件系统最多能存放多少个这样的图像文件? ⑤ M 个 (填写以 M 为单位的数值)  
(3) 若文件 F1 的大小为 31KB，文件 F2 的大小为 33KB，则该文件系统获取 F1 和 F2 最后一个簇的簇号需要的时间是否相同? ⑥ (填写: 相同 或 不相同)

填空题 (24 分) 24 分 (请按题目中的空缺顺序依次填写答案)

- ①
- ②
- ③
- ④
- ⑤
- ⑥

10. Consider a file system on a disk that has both logical and physical block sizes of 512 bytes. Assume that the information about each file is already in memory. Suppose we use indexed allocation and are currently at the 10th logical block. If we want to access the 3rd logical block, how many disk blocks should we access?

单选题 (6分) 6分

- ☐ A. 3
- ☒ B. 1
- ☐ C. 2
- ☐ D. 4

6. 下述设备中，\_\_\_\_ 是块设备。

单选题 (5分) 5分

- ☒ A. 硬盘
- ☐ B. 虚拟终端
- ☐ C. 打印机
- ☐ D. 串行口

8. 如果以硬链接方式共享一个普通文件，但ln命令返回了一个错误信息，以下哪一项可能导致这个错误信息？

单选题 (5分) 5分

- ☐ A. 原始文件是只读的
- ☐ B. 原始文件是防止拷内
- ☒ C. 目标文件和原始文件在不同的文件系统中
- ☐ D. 原始文件(source file)是隐藏的

11. 安装模块的命令是( )。

单选题 (5分) 5分

- ☐ A. lsmod
- ☐ B. modinfo
- ☒ C. insmod
- ☐ D. listmod

16. 在操作系统中，信号量表示资源，其值\_\_\_\_\_。

单选题 (5 分) 5 分

- ☐ A. 只能进行布尔型运算来改变
- ☒ B. 仅能用初始化和P、V操作来改变
- ☐ C. 只能进行加减乘除运算来改变
- ☐ D. 进行任意的算术运算来改变

正确答案: B

17. Which statement is incorrect when executing the "make" command with no parameters in the current directory?

回答错误

单选题 (5 分) 0 分

- ☒ A. make will execute corresponding commands according to rules specified in makefile or Makefile
- ☐ B. make does nothing if no targets exist in makefile, even if Makefile exists
- ☐ C. make does nothing if both makefile and Makefile do not exist
- ☐ D. make will compile the file makefile or Makefile

问的是错的，选的是D

20. 从下列关于驱动程序的论述中，选出一条正确的论述。

单选题 (5 分) 5 分

- ☐ A. 由于驱动程序与I/O设备（硬件）紧密相关，故必须全部用汇编语言书写
- ☒ B. 对于一台多用户机，配置了相同的16个终端，此时可以只配置一个由多个终端共享的驱动程序
- ☐ C. 驱动程序与I/O设备的特性紧密相关，因此应为每一I/O设备配备一个驱动程序
- ☐ D. 驱动程序与I/O控制方式紧密相关，因此对DMA方式应是以字节为单位去启动设备及进行中断处理

D中，是数据块不是字节

## 内存与虚拟存储部分

4. The BTU operating system has a 21-bit virtual address, yet on certain embedded devices, it has only a 16-bit physical address. It also has a 2-KB page size. How many entries are there in each of the following?

a. A conventional, single-level page table . Answer: ① (填写10进制数)

b. An inverted page table. Answer: ② (填写10进制数)

填空题 (16 分) 16 分 (请按题目中的空缺顺序依次填写答案)

- ① 1024
- ② 32

正确答案:

- ① 1024
- ② 32

6. Consider a paging system with the page table stored in memory.
- If a memory reference takes 50 nanoseconds, how long does a paged memory reference take?
  - If we add TLBs, and if 75 percent of all page-table references are found in the TLBs, what is the effective memory reference time? (Assume that finding a page-table entry in the TLBs takes 2 nanoseconds, if the entry is present.)

Answer:

- ① ns
- ② ns

填空题 (14 分) 14 分 (请按题目中的空缺顺序依次填写答案)

①

②

注意TLB是减少了一次去访问内存的时间，存储的是物理页号

4. Consider the two-dimensional array A:
- ```
int A[100][100];
```
- where A[0][0] is at location 200 in a paged memory system with pages of size 200. A small process that manipulates the matrix resides in page 0 (locations 0 to 199). Thus, every instruction fetch will be from page 0.
- For three page frames, how many page faults are generated by the following array-initialization loops, using LRU replacement and assuming that page frame 1 contains the process and the other two are initially empty?

- ```
for (int j = 0; j < 100; j++)  
for (int i = 0; i < 100; i++)  
A[i][j] = 0;
```
- ```
for (int i = 0; i < 100; i++)  
for (int j = 0; j < 100; j++)  
A[i][j] = 0;
```

Answer:

- ① page faults
- ② page faults

5000 50

5. \_\_\_\_\_ memory allocation scheme may produce external fragmentation.

单选题 (3 分) 3 分

- ☐ A. Demand
- ☐ B. system halts
- ☒ C. Multiple-partition
- ☐ D. None of above

21. Implementing LRU precisely in an OS is expensive, so practical implementations often use an approximation called .

单选题 (3 分) 3 分

- ☐ A. MRU
- ☐ B. MFU
- ☐ C. LFU
- ☒ D. NRU

1. 设某计算机的逻辑地址空间和物理地址空间均为64KB，按字节编址。若某进程最多需要6页（Page）数据存储空间，页的大小为1KB，操作系统采用固定分配局部置换策略为此进程分配4个页框（PageFrame）。在时刻260前的该进程访问情况如下表所示（访问位即使用位）。

| 页号 | 页框号 | 装入时刻 | 访问位 |
|----|-----|------|-----|
| 0  | 7   | 130  | 1   |
| 1  | 4   | 230  | 1   |
| 2  | 2   | 200  | 1   |
| 3  | 9   | 160  | 1   |

当该进程执行到时刻260时，要访问逻辑地址为17AFH的数据。请回答下列问题：

- (1) 该逻辑地址对应的页号是 ① ？  
(2) 若采用先进先出（FIFO）置换算法，该逻辑地址对应的物理地址是 ② H（填写4位十六进制数，且字母为大写A、B、C、D、E、F）？  
(3) 若采用时钟（CLOCK）置换算法，该逻辑地址对应的物理地址是 ③ H？（填写4位十六进制数，且字母为大写A、B、C、D、E、F）（设搜索下一页的指针沿顺时针方向移动，且当前指向2号页框，示意图如下。）

这个题要注意的就是，这里的page frame代表的是物理的地址，frame代表实际地址，查页表就是用page number去对应查抄frame的

所以第一个是1 1111 A F 则是1FAFH

## 导论和进程

3. Which of the following instructions should be privileged (in kernel mode)?

多选题 (15 分) 15 分

- ☒ A. Set value of timer  
☐ B. Read the clock.  
☒ C. Clear memory.  
☐ D. Issue a trap instruction.  
☒ E. Turn off interrupts.  
☒ F. Modify entries in device-status table.  
☐ G. Switch from user to kernel mode.  
☒ H. Access I/O device.

正确答案: A C E F H

而系统调用和中断既可以发生在用户态又可以发生在内核态。

12. The main disadvantage of the batch system is \_\_\_\_ ?

单选题 (5 分) 5 分

- ☐ A. low CPU utilization  
☐ B. lack of concurrency  
☒ C. lack of interaction  
☐ D. none of the above

11. Threads belonging to the same process share the \_\_\_\_ .

单选题 (3 分) 3 分

- ☐ A. stack
- ☒ B. data section
- ☐ C. register set
- ☐ D. thread ID

13. A message-passing system is \_\_\_\_ .

单选题 (3 分) 3 分

- ☐ A. A kind of direct communication
- ☐ B. A kind of low-level communication
- ☒ C. A kind of inter-process communication
- ☐ D. A kind of symmetrical communication

正确答案: C

6. Which of the following components of program state are shared across threads in a multithreaded process?

多选题 (6 分) 6 分

- ☐ A. Register values
- ☒ B. Heap memory
- ☒ C. Global variables
- ☐ D. Stack memory

正确答案: B C

16. Which of the following item should not be in the PCB (Process Control Block)?

单选题 (3 分) 3 分

- ☐ A. process state
- ☐ B. CPU-scheduling information
- ☐ C. memory-management information
- ☒ D. code section

能让你找到，但是不是说直接放在里面

23. 以下描述中, \_\_\_\_\_并不是多线程系统的特长

单选题 (3 分) 3 分

- ☐ A. 利用线程并行地执行矩阵乘法运算
- ☐ B. web服务器利用线程请求http服务
- ☒ C. 键盘驱动程序为每一个正在运行的应用配备一个线程, 用来响应相应的键盘输入
- ☐ D. 基于GUI的应用程序用不同线程处理用户的输入、计算、输出等操作

5. Which of the following statement is incorrect?

单选题 (6 分) 6 分

- ☐ A. Virtual machines improve OS development and testing process
- ☐ B. Micro-kernels allow some system services to be implemented just as user programs
- ☒ C. Layered OS is more efficient than monolithic OS
- ☐ D. Monolithic OS is usually difficult to modify

Monolithic OS(整体操作系统)

Layered OS (分层操作系统)

8. Operating system is a set of software for managing\_\_\_\_\_.

单选题 (6 分) 6 分

- ☐ A. Computer hardware
- ☒ B. Computer resources
- ☐ C. Application programs
- ☐ D. Computer software

10. 下列选项中, 通过系统调用完成的操作是 ( )。

单选题 (7 分) 7 分

- ☒ A. 创建新进程
- ☐ B. 生成随机整数
- ☐ C. 页置换
- ☐ D. 进程调度

页置换这个属于异常处理范畴等里面了, 不是调用接口的

## 进程调度





8. Which of the following Critical Section problem solutions results in busy-waiting?

单选题 (5 分) 5 分

- ☐ A. Monitor
- ☒ B. Special machine instruction
- ☐ C. Semaphore
- ☐ D. critical region

8. Banker's algorithm is one of \_\_\_\_\_ algorithm.

单选题 (8 分) 8 分

- ☐ A. deadlock recovery
- ☒ B. deadlock avoidance
- ☐ C. deadlock prevention
- ☐ D. deadlock detection

9. Which of the following operating systems uses Banker's Algorithm to perform deadlock avoidance?

单选题 (8 分) 8 分

- ☐ A. Windows 10
- ☐ B. Linux
- ☐ C. iOS
- ☒ D. None of the above

8. While a process is blocked on a semaphore's queue, it is engaged in busy waiting.

判断题 (4 分) 4 分

- ☐ A. TRUE
- ☒ B. FALSE

9. Suppose a shared printer is printing my job currently. While the printer is in use, you seek to print your job. Under any of the modern OS's which of the following events are likely to happen :

单选题 (6 分) 6 分

- ☐ A. you will be notified that the printer is busy, print later
- ☐ B. my job will be aborted because you are my boss
- ☐ C. your job will be queued based on its priority
- ☒ D. your job will be spooled for printing in the order it arrived

假脱机技术