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| **重庆大学****《操作系统》课程试卷**  命题人：郭平，何静媛 组题人：石亮 审题人：石亮 命题时间：20171031 教务处制  **学院 专业 班 年级 学号 姓名 考试教室**  **公平竞争、诚实守信、严肃考纪、拒绝作弊**  封  线  密 | | | | | | | | | | | |  | |
| **2017**—**2018学年第一学期** | | | | | | | | | | | | | |
| **开课学院：计算机学院 课程号：18012035** | | | | | | | | **考试日期：20171110** | | | | | |
|  | | | | | | | | **考试时间：45分钟** | | | | | |
| **题号** | **一** | **二** | **三** | **四** | **五** | **六** | **七** | | **八** | **九** | **十** | | **总分** |
| **得分** |  |  |  |  |  |  |  | |  |  |  | |  |

**考试提示**

1.严禁随身携带通讯工具等电子设备参加考试；

2.**考试作弊，留校察看，毕业当年不授学位；请人代考、替他人考试、两次及以上作弊等，属严重作弊，开除学籍。**

**Part I:True / False Questions（10\*2points）**

1. ( ) PCB is very important for process. It usually stores all data and code of a process.
2. ( ) Compared to uniprocessor, multiprocessor systems have three main advantages: increased throughput, economy of scale and increased reliability.
3. ( ) When Resource Allocation Graph contains a cycle, it will have a deadlock.
4. ( ) Interrupts may be triggered by either hardware or software.
5. ( ) The difference between a program and a process is that a program is an active entity while a process is a passive entity.
6. ( ) Mutex locks and binary semaphores are essentially the same thing.
7. ( ) The monitor can be used to control exclusive access of critical resources, but it cannot be used for complicated process synchronization.
8. ( ) The system calls provide a programming interface to the operating system, they are called API.
9. ( ) When a user-level thread is created, it can not be scheduled directly by kernel because The kernel can’t realize it.
10. ( ) It is possible to create a thread library without any kernel-level support.

**Part II: Single Choice (10\*2points)**

1. Which of the following would lead you to believe that a given system is an SMP-type system? ( )

A. Each processor is assigned a specific task.

B. There is a master–slave relationship between the processors.

C. Each processor performs all tasks within the operating system.

D. None of the above

1. The ( ) refers to the number of processes in memory.

A. process count B. long-term scheduler

C. degree of multiprogramming D. CPU scheduler

1. Which of the following scheduling algorithms must be nonpreemptive? ( )

A. SJF B. RR C. FCFS D. Priority algorithms

1. A ( ) type presents a set of programmer-defined operations that are provided mutual exclusion within it.

A. transaction B. signal C. binary D. monitor

1. ( ) which of following function is system call ()

A printk B pthread\_create C printf D wait

1. The Apple Macintosh Mac OS X system apply ( ) to build the system.
2. simple structure B. Layered approach
3. Microkernel D. Module
4. Which one is true in the following statements about process? ( )

A. If a process is in running state, it will be turned into ready state when it executes an I/O instruction.

B. The short-term scheduler can pick a proper task from a job pool in the disk.

C. The process control block contains many pieces of information associated with a specific process.

D. All above is not true

1. ( ) refers to the POSIX standard(IEEE 1003.1c) defining an API for thread creation and synchronization.
2. Pthreads B. Threads C. Process D. Plib
3. ( ) scheduling algorithm allows a process move between queues. If a process uses too much CPU time, it will be moved to a lower-priority queue.

A. round-robin B. Multilevel feedback queue

C. priority D. shortest job first

1. Assume two processes want to enter the critical section, the mutual exclusion semaphore S =-1 means: ( )

A. no process in critical section;

B. one process is waiting to enter critical section.

C. two process in critical section;

D. no process is waiting to enter critical section.

**Part I and II Answer:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| I |  |  |  |  |  |  |  |  |  |  |
| II |  |  |  |  |  |  |  |  |  |  |

**Part III: Fill in the Blank(9\*2points)**

1. Each process is represented in the operating system by a ( ).
2. The number of processes completed per unit of time is called ( ).
3. Most programs use ( ) instead of direct system calls to access computer resources.
4. ( ) scheduling algorithm associates with the length of the process’s next CPU burst. It is assigned to the process that has the smallest next CPU burst when CPU is available.
5. Assume 5 processes want to enter critical section, S is the mutual exclusion semaphore, its the maximum value is ( ) and minimum value are ( ).
6. The thread can be divided into two types: ( ) and ( ).
7. ( ) can abstract the hardware of a single computer into several different execution environments, creating the illusion that each separate execution environment is running its own private computer.

**Part IV : *Short* Answer Questions (4\*8points)**

1. What is microkernel structure? Explain the advantage of microkernel structure.
2. Please explain the relationship between mechanism and policy. Please list at one example to state the difference.
3. Please write down a solution with no deadlock for The Dining-Philosophers Problem.

4.Please explain what is CPU scheduling and dispatcher?

**Part V: Integrated Exercises (1\*10points)**

1. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process Burst Time Priority

P1 10 3

P2 1 1

P3 2 2

P4 3 4

P5 6 2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all

at time 0.

1. Draw four Gantt charts illustrating the execution of these processes using

FCFS, SJF, a nonpreemptive priority (a smaller priority number implies

higher priority), and RR (quantum = 1) scheduling.

1. What is the turnaround time of each process for each of the scheduling

algorithms in part a?

1. What is the waiting time of each process for each of the scheduling

algorithms in part a?