

四川大学期末考试试题（闭卷）

2016~2017 学年第 2 学期

A 卷

课程号: 311006040 课程名称: 操作系统 任课教师: _____

适用专业年级: 软件工程 2015 级 学号: _____ 姓名: _____

考试须知

四川大学学生参加由学校组织或由学校承办的各级各类考试,必须严格执行《四川大学考试工作管理办法》和《四川大学考场规则》。有考试违纪作弊行为的,一律按照《四川大学学生考试违纪作弊处罚条例》进行处理。

四川大学各级各类考试的监考人员,必须严格执行《四川大学考试工作管理办法》、《四川大学考场规则》和《四川大学监考人员职责》。有违反学校有关规定的,严格按照《四川大学教学事故认定及处理办法》进行处理。

题 号	一(22%)	二(15%)	三(25%)	四(38%)	卷面成绩
得 分					
阅卷时间					

注意事项: 1. 请务必将本人所在学院、姓名、学号、任课教师姓名等信息准确填写在试题纸和添卷纸上;

2. 请将答案全部填写在本试题纸上;

3. 考试结束,请将试题纸、添卷纸和草稿纸一并交给监考老师。

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## 一、单项选择题（本大题共 11 小题，每小题 2 分，共 22 分）

提示：在每小题列出的四个备选项中只有一个是符合题目要求的，请将其代码填写在下表中。错选、多选或未选均无分。

|   |   |   |   |   |   |   |   |   |    |    |
|---|---|---|---|---|---|---|---|---|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|   |   |   |   |   |   |   |   |   |    |    |

- The two basic steps used by the processor in instruction processing are:
  - Fetch and Execute cycles
  - Instruction and Execute cycles
  - Fetch and Instruction cycles
  - None of the above
- A computer hardware feature that is vital to the effective operation of a multiprogramming operating system is:
  - Very large memory
  - Multiple processors
  - I/O interrupts and DMA
  - All of the above
- The Process Image element that contains the modifiable part of the user space is called the:
  - System Stack
  - Process Control Block
  - User Program
  - None of the above

注：试题字迹务必清晰，书写工整。

本题共 5 页，本页为第 1 页  
教务处试题编号：311-01

4. The basic thread operation related to the change in thread state that occurs when a thread needs to wait for an event is referred to as the:
  - (A) Unblock operation
  - (B) Block operation
  - (C) Spawn operation
  - (D) None of the above
5. The Reader/Writer problem requires that certain conditions be satisfied, such as:
  - (A) Readers may read from the file while writers are writing to it
  - (B) Multiple writers may write to the file simultaneously
  - (C) Any number of readers may simultaneously read from the file
  - (D) None of the above
6. A problem with the largely obsolete Fixed Partitioning memory management technique is that of:
  - (E) Allowing only a fixed number of Processes
  - (F) Internal fragmentation
  - (G) Inefficient use of memory
  - (H) All of the above
7. In the Resource Allocation Denial approach to Deadlock Avoidance, a safe state is defined as one in which:
  - (A) At least one potential process sequence does not result in a deadlock
  - (B) All potential process sequences do not result in a deadlock
  - (C) Several potential process sequences do not result in a deadlock
  - (D) None of the above
8. The fetch policy that exploits the characteristics of most secondary memory devices, such as disks, which have seek time and rotational latency is called:
  - (A) Demand paging
  - (B) Prepaging
  - (C) Swapping
  - (D) None of the above
9. One difficulty with the Shortest Remaining Time (SRT) scheduling technique is:
  - (A) The need to know or estimate required processing times for each process
  - (B) The lack of preemption
  - (C) The starvation of shorter processes
  - (D) All of the above
10. The disk cache replacement strategy that replaces the block that has experienced the fewest references is called:
  - (A) Least Referenced (LR)
  - (B) Least Recently Used (LRU)
  - (C) Least Frequently Used (LFU)

- (D) None of the above
11. The file directory information element that holds information such as the identity of the creator of the file is the:
- (A) Access control information element
- (B) Usage information element
- (C) Address information element
- (D) None of the above

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## 二、名词解释题（本大题共 5 小题，每小题 3 分，共 15 分）。

提示：解释每小题所给名词的含义，若解释正确则给分，若解释错误则无分，若解释不准确或不全面，则酌情扣分。

1. normalized turnaround time
2. external fragmentation
3. reusable resource
4. critical section
5. process image

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## 三、简答题（本大题共 5 小题，每小题 5 分，共 25 分）。

1. What role does the operating system play in a computer?
2. Please describe the page replacement policy of clock strategy employing a use bit and modified bit.
3. Describe the difference between user-level threads and kernel-level threads.
4. List and explain the conditions for deadlock.
5. Draw a figure to show address translation in a segmentation/paging system and give a brief description.

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## 四、问答题（本大题共 3 小题，共 38 分）。

1. For the following sequence of disk track requests: **90, 60, 65, 930, 750, 950, 510, 45, 780, 100**. Assume that a disk with 1000 tracks (0~999), the disk head is initially positioned over track 150 and is moving in the direction of increasing track number. Compute the averages seek length and

detail step of each. (共 12 分)

| FIFO       |                  | C_SCAN     |                  | SCAN       |                  | SSTF       |                  |
|------------|------------------|------------|------------------|------------|------------------|------------|------------------|
| Next track | Number of tracks | Next track | Number of tracks | Next track | Number of tracks | Next track | Number of tracks |
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> process R1 ( ) {     Integer i;     while ( true) {         //从 file1 读一个数到 i;         ReadAnInt (file1, i);         [ ];         B1 = i;         [ ];     } } </pre> | <pre> process R2 ( ) {     Integer i;     while(true) {         //从 file2 读一个数 i;         ReadAnInt (file2, i);         [ ];         B2 = i;         [ ];     } } </pre> | <pre> process W1( ) {     Integer r;     while (true) {         [ ];         [ ];         //计算 B1 和 B2;         r = Calculate (B1, B2);         [ ];         [ ];         Printout(r);     } } </pre> |
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3. Suppose that the following processes arrive for execution at the times indicated, each process will run the listed amount of time. (共 14 分)

| Process | Arrival Time | Service Time |
|---------|--------------|--------------|
| A       | 0            | 4            |
| B       | 3            | 5            |
| C       | 4            | 6            |
| D       | 6            | 2            |

- (A) Draw Gantt charts that illustrate the execution of these processes using first-come-first served (**FCFS**), round-robin (**RR**), shortest process next (**SPN**), Shortest remaining time (**SRT**) and Highest response ratio next (**HRRN**). (10 分)
- (B) Calculate Turnaround time ( $T_r$ ) and  $T_r/T_s$  of each process for each of the scheduling algorithm. (4 分)