四川大学期末考试试题（闭卷）

（2020~2021 学年第 1 学期）　　B 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 2019 级　学号：　姓名：

考生承诺

我已认真阅读并知晓《四川大学考场规则》和《四川大学本科学生考试违纪作弊处分规定（修订）》，郑重承诺：

1、 已按要求将考试禁止携带的文具用品或与考试有关的物品放置在指定地点；

2、 不带手机进入考场；

3、 考试期间遵守以上两项规定，若有违规行为，同意按照有关条款接受处理。

考生签名：

题　号	一（30%）	二（40%）		三（30%）
得　分				
卷面总分		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。

评阅教师	得分

一、单项选择题（本大题共 20 小题，每小题 1.5 分，共 30 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	12	13	14	15	16	17	18	19	20

1. A fetched instruction is normally loaded into the (　　)
   A. Instruction Register (IR)
   B. Program Counter (PC)
   C. Accumulator (AC)
   D. None of the above
2. Information that must be saved prior to the processor transferring control to the interrupt handler routine includes (　　)
   A. Processor Status Word (PSW)

B. Processor Status Word (PSW) & Location of next instruction
C. Processor Status Word (PSW) & Contents of processor registers
D. None of the above

3. The principle objective of a time sharing, multiprogramming system (　)
A. Maximize response time
B. Maximize processor use
C. Provide exclusive access to hardware
D. None of the above

4. A common problem with full-featured operating systems, due to their size and difficulty of the tasks they address, is: (　)
A. Chronically late in delivery
B. Latent bugs that show up in the field
C. Sub-par performance
D. All of the above

5. A process switch may occur when the system encounters an event, such as: (　)
A. Memory fault
B. Supervisor call
C. Trap
D. None of the above

6. One of the disadvantages of User-Level Threads (ULTs) compared to Kernel-Level Threads (KLTs) is (　)
A. Scheduling is application specific
B. Thread switching does not require kernel mode privileges
C. When a ULT executes a system call, all threads in the process are blocked
D. All of the above

7. A chief characteristic of a monitor is: (　)
A. A maximum of two processes may be executing in a monitor at a time
B. A process enters the monitor by invoking one of its procedures
C. Local data variables of the monitor are accessible by any procedure requesting use of the monitor
D. All of the above

8. A conservative strategy for dealing with deadlocks that involves limiting access to resources and imposing restrictions on processes is called: (　)
A. Deadlock Detection

B. Deadlock Prevention
C. Deadlock Avoidance
D. None of the above

9. An example of a consumable resource is the following: (　　)
A. Messages
B. Main Memory
C. Printers
D. All of the above

10. The following requirement must be met by any facility or capability that is to provide support for mutual exclusion: (　　)
A. A process remains in its critical code section for a finite time only
B. Only one process at a time can be allowed into a critical code section
C. No assumptions can be made about relative process speeds
D. All of the above

11. The concept of memory management satisfies certain system requirements, including: (　　)
A. physical organization
B. relocation
C. protection
D. all of the above

12. In the dynamic partitioning technique of memory management, the placement algorithm that scans memory from the location of the last placement and chooses the next available block that large enough to satisfy the request is called: (　　)
A. best-fit
B. next-fit
C. first-fit
D. all of the above

13. The concept associated with determining the number of processes that will be resident in main memory is referred to as: (　　)
A. the page fault frequency
B. a cleaning policy
C. load control
D. none of the above

14. The real address of a word in memory is translated from the following portions of a virtual

address (　　)

A. page number and frame number

B. frame number and offset

C. page number and offset

D. none of the above

15. In the round robin scheduling technique, the principle design issue is: (　　)

A. determining the fair distribution of time quanta to individual processes

B. determining the length of the time quantum

C. determining the method of cycling through a given set of processes

D. none of the above

16. Which of the following scheduling policies allow the o/s to interrupt the currently running process and move it to the ready state? (　　)

A. preemptive

B. first-come-first-served

C. non-preemptive

D. none of the above

17. The disk scheduling algorithm that implements two subqueues in a measure to avoid the problem of "arm stickiness" is the: (　　)

A. fscan policy

B. c-scan policy

C. n-step-scan policy

D. all of the above

18. The I / o technique where the processor busy waits for an i/o operation to complete is called: (　　)

A. interrupt-driven I / o

B. direct memory access (DMA)

C. programmed I / o

D. none of the above

19. 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. all of the above

20. Direct or hashed files are often used where: (　　)

A. very rapid access is required

B. records are always accessed one at a time

C. fixed length records are used

D. all of the above

评阅教师	得分

二、简答题（本大题共 8 小题，每小题 5 分，共 40 分）。

1. Please illustrate the difference between program, process, and thread.

2. Please illustrate the seven-state process state transition diagram.

3. Please illustrate the method of deadlock prevention.

4. Why is the capability to relocate processes desirable?

5. Please Explain thrashing.

6. What is the difference between preemptive and nonpreemptive scheduling?

7. What is the difference between block-oriented devices and stream-oriented devices? Give a few examples of each.

8. List and briefly define five file organizations。

评阅教师	得分

三、问答题（本大题共3小题，每小题10分，共30分）。

1. There is a two-direction measuring temperature gate in the building during the epidemic period, which can be entered and out. The gate can only go in one direction at a time. Please describe the following process with Semaphores:(1) If a person in a particular direction owns the gate, let the same direction person pass the gate;(2) The out person has priority.

2. Consider the following snapshot of a system with four resource types A, B, C and D, and five processes P0, P1, P2, P3 and P4

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	2	0	0	0	2	14	10	0	2	10	4	0
P1	0	0	2	4	0	0	2	4				
P2	2	6	10	8	4	6	10	12				
P3	0	12	6	4	0	12	10	4				
P4	0	0	2	8	0	12	10	12				

Answer the following questions using banker's algorithm.

A. Fill in the contents of the Need matrix below.

	Need			
	A	B	C	D
P0				
P1				
P2				
P3				
P4				

B. Is the system in a safe state? Explain why?

P#	Work			
	A	B	C	D

C. Safe sequence: _____

3. A system receives a series of page references in the following order: 2，4，8，3，2，4，5，2，4，8，3，5. The system has four page frames. If all of the frames are initially empty, calculate the number of page faults using each of these algorithms.(note: Please write out replacement process)

   (A) LRU replacement

   (B) FIFO replacement

   (C) OPT replacement