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. The program counter register contents: _____

   (A) The next instruction to be executed

   (B) The memory addresses of next instruction to be executed

   (C) The number of instructions

   (D) The memory addresses of executed instruction

2. Which one is not the execution context of process _____?

   (A) program counter register

   (B) process state word

   (C) base register

   (D) program codes

3. When there is out of memory, the state of new created process may :_____

   (A) ready

   (B) blocked

   (C) ready/suspend

   (D) blocked/suspend

4. Compared to processes, which one is not the advantage of threads:_____

   (A) less generation time

   (B) less switch time

   (C) less execution time

   (D) high communication performance

5. Typically, the swapping-in and swapping-out function for processes is based on the need to manage:_____

   (A) Process priorities

   (B) Virtual memory

   (C) The degree of multiprogramming

   (D) Starvation avoidance of process

6. A process may hold allocated resources while awaiting assignment of others is referred to as:____

   (A)Mutual exclusion

   (B)Hold-and-wait

   (C)No preemption

   (D)Circular wait

7. A semaphore that does not specify the order in which processes are removed from the queue is called a:

   _____

(A) Weak semaphore

(B) Strong semaphore

(C) Binary semaphore

(D) None of the above

8. There is no internal fragmentation in:_____

(A) fixed Equal-size partitions

(B) fixed Unequal-size partitions

(C) Dynamic Partitioning

(D) Paging

9. The situation that occurs when the desired page table entry is not found in the Translation Look aside Buffer (TLB) is called a: _____

(A) TLB miss

(B) TLB hit

(C) Page fault

(D) None of the above

10. Which one of the following uniprocessor Scheduling strategy may has the highest throughput when there are many I/O bound processes _____?

(A) FCFS

(B) RR

(C) SRT

(D) VRR

11. In which of the following file allocation methods is preallocation required:_____

(A) Contiguous

(B) Chained

(C) Indexed

(D) Random

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. Interrupt
2. JCL
3. Busy waiting
4. PCB
5. Page Fault

三、简答题（本大题共 5 小题，每小题 5 分，共 25 分）。

1. What is deadlock? How to prevent deadlock?

2. List and briefly define five file organizations.

3. Please describe the implementation methods of Segment-page

4. What is the difference between HRRN and FCFS? How HRRN avoids the disadvantages of FCFS.
5. What is the difference among deadlock avoidance, detection, and prevention?

四、问答题（本大题共 3 小题，共 38 分）。

1. There are 5 processes: P1, P2, P3, P4, P5, and 3 types of resources: A, B, C. The current resource allocation state was listed by the following tables: （共 13 分）

	Claim			Allocation		
	A	B	C	A	B	C
P1	5	5	9	2	1	2
P2	5	3	6	4	0	2
P3	4	0	11	4	0	5
P4	4	2	5	2	0	4
P5	4	2	4	3	1	4

Available		
A	B	C
2	3	3

Please answer the following questions by Banker's Algorithm.

(A) The current stats are safe state? Please provide the reasons and steps.

(B) If process P4 make a request {0, 3, 4}, the OS should accept it? Why?

2. Suppose that the following processes arrive for execution at the times indicated, each process will run the listed amount of time. (13 分)

Process	Arrival Time	Service Time
P1	0	4
P2	2	7
P3	4	6
P4	7	2

(A) Draw Gantt charts that illustrate the execution of these processes using first-come-first served **(FCFS),** shortest process next **(SPN),** Shortest remaining time **(SRT)**, with time slicing q = 1.

(B) Calculate Turnaround time (Tr) and Tr/Ts of each process for each of the scheduling algorithm.

3. There are 4 processes: P1, P2, P3, P4 and each needs 4k,3k,4k, 5k physical memory respectively, and the available physical memory is 15k as shown in the following: （共 12 分）

0	
1	
2	
3	
4	
5	
6	
7	
8	
9	

10	
11	
12	
13	
14	

Please answer the following questions by memory paging strategy.

(A) Suppose the page size is 1k, and when the order of the process load in and out is:

(1) Load process A

(2) Load process B

(3) Load process C

(4) Unload process B

(5) Load process D

Draw the memory state after each load in or load out step.

(B) If a logical address is 0000010111011110, calculate its physical address, suppose the page size is 1k, the length of the page number is 6, and the page table is:

0001101
1000111
2010001