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任课教师：_____ 学号：_____ 姓名：_____ 班级：_____

西 安 电 子 科 技 大 学

考试时间 120 分钟

试　　题

题号	一	二	三	总分
分数				

1. 考试形式：闭卷；2。考试日期　　年　月　日 3. 本试卷共四大题，满分 100 分。

Part1: Select one answer for each question (Total 10 points, each 2)

1. In the following moments, which one may involve scheduling?

A. Process Creates　　B. Process exits

C. user process make a user function call.　D. All of the above

2. Is stack segment a part of one process?

A. Yes　　B. No

C. Sometimes　　D. no relation

3. Which statement in the following is TRUE?

A. MMU means Main Memory Usage..

B. MMU usually is in CPU

C. MMU is a part of main memory.

D. TLB is a kind of I/O device, very slow.

4. For the virtual memory, which statement listed below is CORRECT?

A. Usually, each process has its own page table.

B. To speed up the translation from virtual address to physical address, multi-level page table is introduced.

C. For each virtual address, the page table must store one physical address for this virtual address.

D. None of the above

5. For the statements about quota table, which one is correct?

A. It limits both the number of files and disk blocks.

B. Quota table doesn't exist.

C. It only limits the number of files.

D. It only limits the number of disk blocks.

6. Which option listed below can be used to implement one Sleep-Wakeup Lock?

A. Use semaphore

B. Use TSL or XCHG

C. Use fork system call

D. None of the above.

7. To prevent the deadlock by breaking the Circular Wait condition, we can____

A. Spool everything. B. Request all resources initially.

C. Take resources away. D. Order resources numerically.

8. For symbolic link, which statement listed below is TRUE?

A. OS has to allocate one inode to create it.

B. OS need not to allocate one inode to create it.

C. symbolic link is same as hard link except hard link refer to an I/O hardware.

D. None of the above

9. For the vmware workstation software, is it a Type II hypervisor?

A. Yes

B. No, it is a Type I hypervisor.

C. Yes, but it is also a Type I hypervisor.

D. No, and it is not a Type II hypervisor.

10. From the user's point of view, the operating system is _____.

A. Software designed to capture the logic of every application.

B. Extended machine, i.e. providing an abstract interface between user and computer hardware.

C. A set of resources

D. Another name for hardware

Part2: Essay Questions (Total 30 points, each 5)

1. What is the difference between the system call and function defined in user space? And then please why system call is introduced?

2. Please answer the question listed below and explain WHY:
Is it correct to use absolute addresses in a shared library?

3. For one page entry, there's a protection bit: x, please explain the benefits of this protection bit.

4. Can optimal page replacement be implemented? Please answer and explain why. If your answer is No, then please explain why we still need study optimal page replacement?

5. What is the function of magic number in a executable file?

6. What is PCB? And please list at least two functions of PCB.

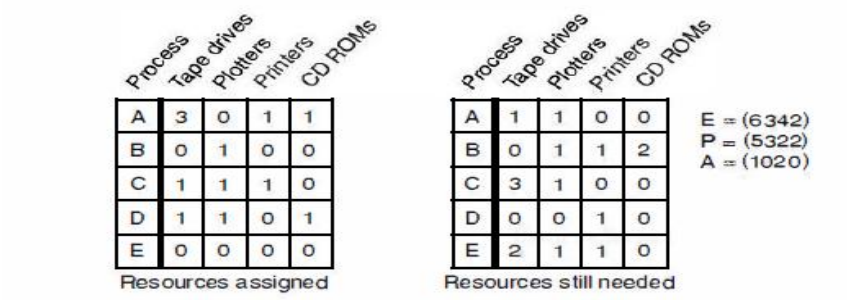
Part3: Integrate Questions (Total 50 points, each 10 points).

1. For the solution of producer-consumer problem listed below, please find the bugs and give the pseudo code to fix these bugs.

```
#define N 100                                   /* number of slots in the buffer */
int count = 0;                                  /* number of items in the buffer */

void producer(void)
{
     int item;

     while (TRUE) {                             /* repeat forever */
          item = produce_item( );               /* generate next item */
          if (count == N) sleep( );             /* if buffer is full, go to sleep */
          insert_item(item);                    /* put item in buffer */
          count = count + 1;                    /* increment count of items in buffer */
          if (count == 1) wakeup(consumer);     /* was buffer empty? */
     }
}


void consumer(void)
{
     int item;

     while (TRUE) {                             /* repeat forever */
          if (count == 0) sleep( );             /* if buffer is empty, got to sleep */
          item = remove_item( );                /* take item out of buffer */
          count = count – 1;                    /* decrement count of items in buffer */
          if (count == N – 1) wakeup(producer); /* was buffer full? */
          consume_item(item);                   /* print item */
     }
}
```

2. Given memory holes (i.e., unused memory blocks) of 100K, 500K, 600K, and 300K (in address order) as shown below, how would each of the first-fit, next-fit, best-fit, and worst-fit algorithms allocate memory requests of 190K, 220K, 90K and 350K (in this order)? The shaded areas are used allocated regions that are not available. Write your answer into the following figures. You should write down the size of each allocated and unused memory block.

3. For the current resource allocation and requirement matrix and resource vectors（Vector E represents total resources, vector P represents allocated resource at present time, vector A represents currently available resources）listed below, is the current state an *unsafe* state? And explain why.



Process	Tape drives	Plotters	Printers	CD ROMs
A	3	0	1	1
B	0	1	0	0
C	1	1	1	0
D	1	1	0	1
E	0	0	0	0

Resources assigned

Process	Tape drives	Plotters	Printers	CD ROMs
A	1	1	0	0
B	0	1	1	2
C	3	1	0	0
D	0	0	1	0
E	2	1	1	0

Resources still needed

E = (6342)
P = (5322)
A = (1020)

4. Please use P、V operations to write two programs and when these two programs run at the same time, they will definitely reach a deadlock state.

5. ①For the program listed below, how many "os exam" will be printed? Please explain your answer.

```
int main()
{
    pid_t pid;
     int i;
     for(i=0;i<2;i++)
     {
          pid=fork();
          printf(“os exam\n”);
     }
}
```

②For the program above, if we replace fork() system call with a exec system call, how many “os exam” will be printed? And please explain why.