

## 國立台灣科技大學九十五學年度碩士班招生試題

系所組別：電子工程系碩士班甲組

科 目：作業系統

總分 100 分

1. (10%) After executing the program shown below, how many times of 'a', 'b', 'c' and 'd' are printed on the screen?

```
main()
{
    printf("a\n");
    fork();
    printf("b\n");
    fork();
    printf("c\n");
    fork();
    printf("d\n");
}
```

2. (10%) (a) What is the second chance FIFO page replacement algorithm?  
 (b) What is the NRU page replacement algorithm?  
 (c) Compare those two page replacement algorithms.
3. (10%) Suppose that a scheduling algorithm (at the level of short-term CPU scheduling) favors those processes that have used the least processor time in the recent past. Why will this algorithm favor I/O-bound programs and yet not permanently starve CPU-bound programs?
4. (10%) Consider the following snapshot of a system.  $P_0, P_1, P_2$  and  $P_3$  are processes and A and B are resources. Show that this system is now deadlocked.

Available

A	B
0	0

	Allocation		Request	
	A	B	A	B
$P_0$	0	1	0	0
$P_1$	2	0	2	0
$P_2$	3	0	1	0
$P_3$	2	1	1	0

5. (10%) Suppose that directory entries for every directory fit in one disk block and the i-node for current working directory is already in memory. How many disk references are needed to open the file `games/dragon/part1` in UNIX? (Assume that no name cache for file `games/dragon/part1`.) (explain it, don't just give the number of disk references.)



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6. (10%)What is the context-switch? What does the kernel do during the context switch?
7. (10%)What are the advantages of the Copy-on-Write in demand paging system?
8. (10%)Which place should the Page-Table locate? (1) CPU (2) cache (3) memory (4) high speed disk. Explain the reason.
9. (10%)When a process in Runing-state, what event can change its state into Ready-state? And what event can change the the runing process's state into the Waiting-state?
10. (10%)When doing DMA block data transfer, special consideration must be taken to handle the virtural address. Why?

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