# 操作系统试卷参考答案和评分标准

## Part 1. Answer Sheet:（每小题 1 分，共计 70 分）

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| A | D | D | C | C | C | B | B | B | B |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| A | A | D | D | D | C | C | C | C | B |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| A | A | A | D | D | D | D | C | B | B |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| A | A | A | A | D | C | C | B | B | B |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| A | A | B | B | C | C | D | D | A | A |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| A | B | C | D | A | B | C | D | A | B |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| A | B | B | B | C | C | C | D | D | D |

## Part 2.

**1．Answer: 12 分**

a. Turnaround time（共10分，错1个扣0.5分）

FCFS RR SJFPriority

*P*1 10 19 19 16

*P*2 11 2 1 1

*P*3 13 7 4 18

*P*4 14 4 2 19

*P*5 19 14 96

b. Shortest Job First（2 分）

**2．Answer: 6 分**（2小题各 3 分）

(1) Number[i] = 1 + max(Number[1], ..., Number[NUM_THREADS]);

This line of statement is not an atomic operation. If there is a breakout by the scheduler before and after the assignment operation, "=", it may result in the snapshot, in which Number[i] == Number[j]

(2) Demo

```
/* we have no choosing mechanism.
    Pi                          Pj
*/
                                ->reg = max(.....) + 1;
    ->reg = max(...) + 1;
                                ->set number[j] = reg;

                                ->for(index = 0; index < n; index++)
                                ->run when index == i;
```

->while((number[index]!=0 && (number[index,index] < number[j,j]));

/******* NOTE! the process i hasn't set number[i],so the condition is false *********/

-> enter critical section

->set number[i] = reg;

->while((number[index]!=0 && (number[index],index) < number[i],i)));

/*-----------------------------------------------------------*/

/** here we can conclude that Pi can enter critical section as well as Pj **/

**3．Answer: 4 分**

0.2 _sec = (1 − P) ×0.1 _sec + (0.3P) ×8 millisec + (0.7P) ×20 millisec
0.1 = −0.1P + 2400 P + 14000 P
0.1 =16,400 P
P =0.000006
（答案正确的，给 4 分。答案不正确但是表达式正确，给 2 分）

4．**Answer:8 分**

LINUX 的直接地址指针有 12 个，还有一个一级索引，一个二级索引，一个三级索引。因此
可管理的最大 blocks 为 $12 + (4096/4) + (4096/4)^2 + (4096/4)^3 = 12 + 2^{10} + 2^{20} + 2^{30}$
可管理的最大文件为 4KB * blocks = 48KB + 4MB + 4GB + 4TB

（答案正确的，给 8 分。计算得出 48KB、4MB、4GB、4TB，各给 2 分）
4299165744KB * 1024