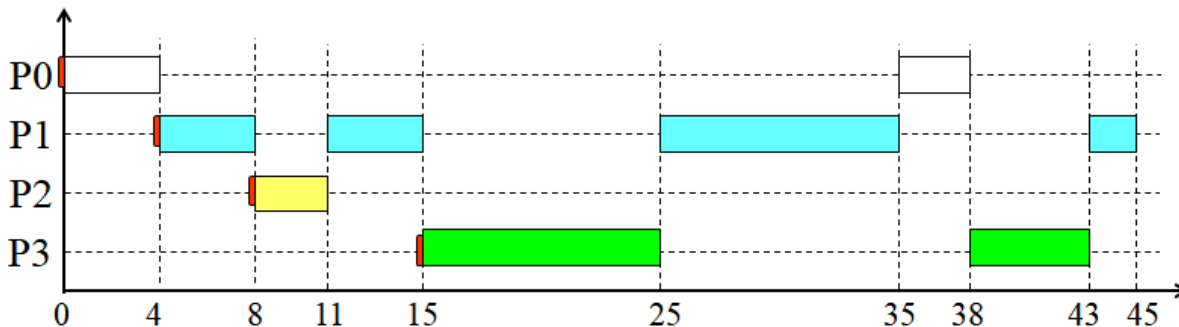


一. (10 points) Select the best answer for each blank

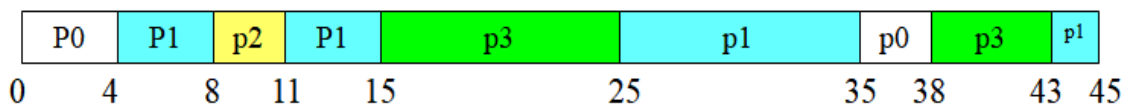
C B D B D C D D C C

二. (12 points)

(1) (8 points) the Gantt chart that illustrates the execution of these processes



or



(2) (4 points) the turnaround times for the four processes

P0: 38ms P1: 41ms P2: 3ms P3: 28ms

三. (13 points)

(1) (2 points) (A, B, C, D)=(4, 2, 3, 1)

(2) (1+4 points) 无死锁，可以按照 P₃、P₂、P₁、P₄ 的顺序依次执行完

只回答有无死锁，没有给出正确原因（即进程执行顺序）扣分。如果出现安全序列，概念错误，扣 1 分

(3) (2+4 points) 当的 P₂ 的请求向量变为(2, 1, 0, 1)时，只能首先执行 P₃，之后空闲可用资源向量变为(2, 2, 2, 0)，无法满足 P₁、P₂、P₄ 的资源需求，因此这 3 个进程处于死锁。

没有正确指出哪些进程处于死锁，扣分。

四. (15 points)

(1) (3 points) the definitions and initial values of semaphores:

Int count_phone=100; //可销售的手机总数，初值 100

Int count_customer=0; //大厅内的顾客数量，初值 0

Semaphore

Saler=1; //销售员状态，初值 1，空闲

Customer=0; //大厅内的顾客数，初值 0

Mutex_c=1; //用于对顾客计数的互斥操作

Mutex_p=1; //用于对手机计数的互斥操作

(2) (12 points) the code structure of the salesman process and the customer process:

Saler(): (4 points)

```
While(1){
    Wait(customer);
    提供服务;
    Wait(saler);
}
```

```

Customer(){
    Wait(mutex_c);
    If (count_c==20) {signal(mutex_c); exit();}
    mutex_c++;
    signal(mutex_c);
    signal(customer);
    wait(saler);
    wait(mutex_p);
    if (count_phone==0){
        signal(mutex_p);
        wait(mutex_c);
        count_c--;
        signal(mutex_c);
        exit();
    }
    购买;
    Count_phone--;
    Signal(mutex_p);
    wait(mutex_c);
    count_c--;
    signal(mutex_c);
}

```

5. (12 points)

(1) (4 points) the reference string?

1, 1, 2, 2, 3, 4, 4, 4, 2, 1, 1, 2, 2, 3, 3, 3, 5, 5, 6, 6, 6, 7, 7, 6, 6, 2, 2, 1, 1, 1, 2, 2, 2, 6, 6

or

1, 2, 3, 4, 2, 1, 2, 3, 5, 6, 7, 6, 2, 1, 2, 6.

(2) (12 points)

(10 points)

	1	2	3	4	2	1	2	3	5	6	7	5	2	1	2	6
-	1	1	1	1					1	6	6		6	1		1
-	-	2	2	2					2	2	7		7	7		6
-	-	-	3	3					3	3	3		2	2		2
-	-	-	-	4					5	5	5		5	5		5
	F	F	F	F					F	F	F		F	F		F

(2 points) 10 page faults

6. (13 points)

(4 points) 0, 20123 invalid

(5 points) 0, 12300 40976

(4 points) 1, 5000 page fault

七. (12 points)

- (1) (4 points) 143 130 86 913 948 1022 1470 1509 1750 1774 (3 points)
1745 (1 points)
- (2) (4 points) 143 913 948 1022 1470 1509 1750 1774 4999 0 86 130 (3 points)
9985 (1 points)
- 3) (4 points) 143 913 948 1022 1470 1509 1750 1774 4999 130 86 (3 points)
9769 (1 points)

8. (13 points)

- (1) (4 points) the file size that can be accessed directly through FCB is: .
512B*10
- (2) (4 points) the maximum address space accessible through the FCB is:
(10+256+256*256+256*256*256) *512B
- (3) (5 points) 5 times I/O for 5 disk blocks must be read into memory. They are:
1 (C) +1 (B) +1 (M 的 FCB) +1 (index block) +1 (data block)