1. 100% Because no I/O;

2. Process 0
3.   cpu
4.   cpu
5.   cpu
6.   cpu
7.   cpu
8.
9. Process 1
10.   cpu
11.   cpu
12.   cpu
13.   cpu
14.   Cpu
15. Time   PID: 0   PID: 1   CPU   IOs
16.   1   RUN:cpu   READY   1
17.   2   RUN:cpu   READY   1
18.   3   RUN:cpu   READY   1
19.   4   RUN:cpu   READY   1
20.   5   RUN:cpu   READY   1
21.   6   DONE   RUN:cpu   1
22.   7   DONE   RUN:cpu   1
23.   8   DONE   RUN:cpu   1
24.   9   DONE   RUN:cpu   1
25. 10   DONE   RUN:cpu   1

2.
Time is 10.
Process 0
  cpu
  cpu
  cpu
  cpu

Process 1
  Io

Time   PID: 0   PID: 1   CPU   IOs
  1   RUN:cpu   READY   1
  2   RUN:cpu   READY   1

```
 3   RUN:cpu   READY      1
 4   RUN:cpu   READY      1
 5    DONE   RUN:io      1
 6    DONE   WAITING          1
 7    DONE   WAITING          1
 8    DONE   WAITING          1
 9    DONE   WAITING          1
10*    DONE    DONE
```
3.
The first run 1 time I/O, and then the second process run. Meanwhile the first process is waiting for the second one.
Process 0
 io

Process 1
 cpu
 cpu
 cpu
 cpu
```
Time   PID: 0   PID: 1     CPU     IOs
 1    RUN:io    READY      1
 2   WAITING  RUN:cpu      1      1
 3   WAITING  RUN:cpu      1      1
 4   WAITING  RUN:cpu      1      1
 5   WAITING  RUN:cpu      1      1
 6*    DONE     DONE
```
4.
The first process runs I/O first, and then wait for the second process. The second one is ready for running. The time is 9.
```
Time   PID: 0   PID: 1     CPU     IOs
 1    RUN:io    READY      1
 2   WAITING    READY          1
 3   WAITING    READY          1
 4   WAITING    READY          1
 5   WAITING    READY          1
 6*    DONE   RUN:cpu      1
 7     DONE   RUN:cpu      1
 8     DONE   RUN:cpu      1
 9     DONE   RUN:cpu      1
```
5.
Reset the processes
```
Time   PID: 0   PID: 1     CPU     IOs
 1    RUN:io    READY      1
 2   WAITING  RUN:cpu      1      1
```

3	WAITING	RUN:cpu	1	1	
4	WAITING	RUN:cpu	1	1	
5	WAITING	RUN:cpu	1	1	
6*	DONE	DONE			

6.

The first is waiting for I/O first. The second one run first. The third and the forth one are ready for the completion of second one. When the third one and the forth one are running, the first one is ready to run. The time is 27.

Time	PID: 0	PID: 1	PID: 2	PID: 3	CPU	IOs
1	RUN:io	READY	READY	READY	1	
2	WAITING	RUN:cpu	READY	READY	1	1
3	WAITING	RUN:cpu	READY	READY	1	1
4	WAITING	RUN:cpu	READY	READY	1	1
5	WAITING	RUN:cpu	READY	READY	1	1
6*	READY	RUN:cpu	READY	READY	1	
7	READY	DONE	RUN:cpu	READY	1	
8	READY	DONE	RUN:cpu	READY	1	
9	READY	DONE	RUN:cpu	READY	1	
10	READY	DONE	RUN:cpu	READY	1	
11	READY	DONE	RUN:cpu	READY	1	
12	READY	DONE	DONE	RUN:cpu	1	
13	READY	DONE	DONE	RUN:cpu	1	
14	READY	DONE	DONE	RUN:cpu	1	
15	READY	DONE	DONE	RUN:cpu	1	
16	READY	DONE	DONE	RUN:cpu	1	
17	RUN:io	DONE	DONE	DONE	1	
18	WAITING	DONE	DONE	DONE		1
19	WAITING	DONE	DONE	DONE		1
20	WAITING	DONE	DONE	DONE		1
21	WAITING	DONE	DONE	DONE		1
22*	RUN:io	DONE	DONE	DONE	1	
23	WAITING	DONE	DONE	DONE		1
24	WAITING	DONE	DONE	DONE		1
25	WAITING	DONE	DONE	DONE		1
26	WAITING	DONE	DONE	DONE		1
27*	DONE	DONE	DONE	DONE		

Stats: Total Time 27
Stats: CPU Busy 18 (66.67%)
Stats: IO Busy 12 (44.44%)

7. The first one is not ready to run, and the time is shorter than the question 6. The cup usage is 100%.

Time	PID: 0	PID: 1	PID: 2	PID: 3	CPU	IOs
1	RUN:io	READY	READY	READY	1	

2	WAITING	RUN:cpu	READY	READY	1	1
3	WAITING	RUN:cpu	READY	READY	1	1
4	WAITING	RUN:cpu	READY	READY	1	1
5	WAITING	RUN:cpu	READY	READY	1	1
6*	RUN:io	READY	READY	READY	1	
7	WAITING	RUN:cpu	READY	READY	1	1
8	WAITING	DONE	RUN:cpu	READY	1	1
9	WAITING	DONE	RUN:cpu	READY	1	1
10	WAITING	DONE	RUN:cpu	READY	1	1
11*	RUN:io	DONE	READY	READY	1	
12	WAITING	DONE	RUN:cpu	READY	1	1
13	WAITING	DONE	RUN:cpu	READY	1	1
14	WAITING	DONE	DONE	RUN:cpu	1	1
15	WAITING	DONE	DONE	RUN:cpu	1	1
16*	DONE	DONE	DONE	RUN:cpu	1	
17	DONE	DONE	DONE	RUN:cpu	1	
18	DONE	DONE	DONE	RUN:cpu	1	

Stats: Total Time 18
Stats: CPU Busy 18 (100.00%)
Stats: IO Busy 12 (66.67%)
8.

From question 7 and question 6, IO_RUN_IMMEDIATE is faster than IO_RUN_LATER.

SWITCH_ON_IO is faster than SWITCH_ON_END