

Due: December 15, 2012: 2:00 pm

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Note: A handwritten solution is unacceptable.

1. [5.0 points] What is starvation? Can starvation occur under the following scheduling strategies?
  - a. FCFS
  - b. SJF
  - c. SRTF
  - d. RR
2. [4.0 points] What is the advantage in having different time quantum sizes for different queues in multilevel scheduling schemes?
3. [4.0 points] Why is FCFS the lowest level scheduling discipline of a multilevel queue (without feedback)?
4. [4.0 points] I/O bound processes are generally favored in multilevel feedback scheduling. Explain why.
5. [8.0 points] Consider the following processes as shown in the following table. A process with smaller priority number has a higher priority.

Process ID	CPU Burst time	Arrival time	Priority	Finished time	Waiting time
P1	23	0	4		
P2	8	3	2		
P3	17	18	3		
P4	12	20	1		

Show the Gantt chart for these processes and complete the table above using priority scheduling with preemptions.

6. [20.0 points] Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority
<i>P1</i>	10	3
<i>P2</i>	1	1
<i>P3</i>	2	3
<i>P4</i>	1	4
<i>P5</i>	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time zero.

- [12.0 points] Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.
- [6.0 points] What is the turnaround time of each process for each of the scheduling algorithms in part a?
- [2.0 points] Which of the schedules in part a results in the minimal average waiting time (over all processes)?