

## CISC 3320 HOMEWORK 4

**1.)** Discuss how the following pairs of scheduling criteria conflict in certain settings.

- a. CPU utilization and response time
- b. Average turnaround time and maximum waiting time
- c. I/O device utilization and CPU utilization

**2.)** Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process    Burst    Time    Priority

$P_1$	10	3
$P_2$	1	1
$P_3$	2	3
$P_4$	1	4
$P_5$	5	2

The processes are assumed to have arrived in the order  $P_1, P_2, P_3, P_4, P_5$ , all at time 0.

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

**3.)** Consider a system implementing multilevel queue scheduling. What strategy can a computer user employ to maximize the amount of CPU time allocated to the user's process?

**4.)** Five jobs are waiting to be run, their expected run times are 9, 6, 3, 5, and X. In what order should they be run to minimize average response time?

Hint; your answer will depend on X.