

CSI 4337

Exam #1

Sept. 21, 2005

Name _____

All questions are worth 10 points. Maximum score: 70

1. Suppose Process A is running and Process B is waiting for I/O. Give the steps that must occur for Process B to start running.

2. What is a privileged instruction? Why are they necessary? Give an example of a privileged instruction.

3. What is wrong with the following solution to the bounded buffer problem? Be specific. Can I do a quick-fix of this using a single semaphore?

shared int Buffer[SIZE],SP=0,RP=0,Count=0;

Sender

```
while (Count == SIZE);  
Buffer[SP] = Smsg;  
SP = (SP+1)%SIZE;  
Count++;
```

Receiver

```
while (Count == 0);  
RMsg = Buffer[RP];  
RP = (RP+1)%SIZE;  
Count--;
```

4. Which scheduling algorithm gives the minimum average waiting time? Why is this so?

5. The following five processes arrive at time zero in the order given. For these processes, compute a) the average wait time, and b) the average turn-around time, for the two algorithms Shortest Job First, First Come First Served.

Process	Burst Time
P1	3
P2	9
P3	2
P4	5
P5	1

6. Show how to protect the following shared variable operations using TestAndSet.

Process 1

Process 2

$Q = Q + 3;$

$Q = Q - 8;$

7. Explain the term “System Call.” Tell what it is, why it is needed and give one or two examples of system calls.