

Name \_\_\_\_\_

All questions are worth 10 points. Maximum score: 100.

1. Is the following system deadlocked? If not show the “safe sequence” otherwise, list the processes that are deadlocked.

	Has			Req			Free		
	A	B	C	A	B	C	A	B	C
P0	1	2	1	3	0	1	1	0	0
P1	1	0	1	0	2	0			
P2	0	1	1	0	0	0			
P3	1	0	1	1	1	0			
P4	0	0	0	0	1	3			

2. Given the two shared variables Acct1 and Acct2 which represent two account balances. The initial balance is \$200 in each account. Process 1 transfers \$10 from Acct1 to Acct2, while Process 2 transfers \$30 from Acct2 to Acct1. Unfortunately, the programmer that created the program for these processes forgot to use semaphores to protect the shared variables. Assuming that no more than one error occurs, what are the possible final values of each account?

3. Translate the following real addresses into virtual addresses using the following hierarchical page table. Addresses are specified in decimal, with four digits per address. The first digit indexes the first-level table while the second indexes the second-level table. If an address can't be translated, write "Seg. Fault" in the real address box.

First-Level Table.	Secondary table addresses (and contents)			
	0012	1000	0300	2222
0012	21xx	35xx	43xx	99xx
1000	77xx	25xx	47xx	89xx
0300	32xx	65xx	48xx	92xx
2222	14xx	55xx	84xx	87xx

Virtual	Real
0012	
0433	
0321	
1214	
4211	
3300	
2127	
3202	
1123	
2115	

4. Given the following five processes and associated burst times, give the GANTT chart for the scheduling algorithms First Come First Served (FCFS), Shortest Job First (SJF), and Round Robin with a quantum of 3. Give the average wait time for each algorithm

<b>Process Number</b>	<b>Burst Time</b>
0	4
1	6
2	3
3	5
4	2

5. Assume that a process is assigned three page frames and that demand paging is being used. Given the following reference string, how many page faults will occur with the LRU algorithm, the FCFS algorithm and the OPT algorithm? Show your work for each algorithm

1,2,1,3,1,4,1,2,1,3,4,2,1,3,4,2

6. Explain the structure of the NTFS. Explain the function of the master file table, and file attributes. Describe the structure of a directory.



9. Explain the difference between the file organizations Indexed, Linked List, and Multiple contiguous blocks.

10. What is the first thing you would expect to find on any hard disk or floppy disk?