

## Sample Questions for CSCI 593 Test-Out Exam

The following are some sample questions for the CSCI 593 Test-Out Exam. They are meant to give you an idea of some of the types of questions that may be asked on the exam. Note that the sample questions are based on several different chapters of the textbook:

Abraham Silberschatz, Peter Galvin and Greg Gagne, *Operating System Concepts with Java*, John Wiley and Sons, Inc., 7<sup>th</sup> edition, ISBN 0-471-76907-X.

You must check with the CSCI department to find out which chapters will be the basis for your CSCI 593 Test-Out exam.

Chapter 5: The following table describes the CPU burst times for five processes. The time of their initial arrival to the ready queue is as indicated. Related priorities are also indicated but are only to be used in part b. All time values are given in milliseconds.

Process	Arrival Time	CPU Burst Time	Priority
P1	0	5	5
P2	3	15	2
P3	6	5	4
P4	9	10	3
P5	12	15	1

For each of the following parts, using the indicated scheduling algorithm draw the Gantt chart and compute the average waiting time.

- First Come, First Served (FCFS).
- Non-preemptive priority.

(see Section 5.3; also problem 5.4 in the textbook is similar)

Chapter 7: Consider the following description of a resource-allocation graph:

Let the set of processes be:  $P = \{P_1, P_2, P_3, P_4, P_5, P_6, P_7, P_8\}$ .

Let the set of resource types be:  $R = \{R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}\}$ ; there is only one instance of each resource type.

Let the set of request and assignment edges be:

$$E = \left\{ \begin{array}{l} P_1 \rightarrow R_2, P_2 \rightarrow R_7, P_3 \rightarrow R_6, P_4 \rightarrow R_5, \\ P_6 \rightarrow R_9, P_8 \rightarrow R_3, R_2 \rightarrow P_3, R_3 \rightarrow P_2, \\ R_5 \rightarrow P_5, R_6 \rightarrow P_4, R_7 \rightarrow P_6, R_8 \rightarrow P_4, \\ R_9 \rightarrow P_8 \end{array} \right\}$$

a. Draw the resource-allocation graph.

(see Section 7.2.2 of the textbook for similar problems)

Chapter 9: Assume that the page reference string for a process is as follows:

4, 5, 6, 1, 6, 2, 6, 3, 1, 5, 8, 4, 8, 5, 1

That is, this is the sequence of pages that were referenced by a process.

Suppose the process is assigned 3 page frames. How many faults would be produced while servicing the above memory requests under the LRU page replacement policy?

(See Section 9.4 of the textbook for similar problems)

Chapter 11: Assume that the operating system keeps track of free disk blocks (free-space list) by using a bit vector. If we have a 128 giga-byte (GB) disk and the block size is 512 bytes, how many bytes are required to maintain the bit vector?

(See Section 11.5.1 of the textbook for similar problems)