Midterm Review
Chapter 6-8

Peterson's Solution

- **Critical section (core topic)**
  - **Peterson's solution**
  - **Semophore/mutex**
  - **Monitor**
  - **Classic sync questions**
- ***Q: Concept: Busy waiting/spinlock?***
- ***Q: Explain why spinlocks are not appropriate for single-processor systems yet are often used in multiprocessor systems?***

Ch 7

- **Deadlock Characterization (core topic)**
- **Resource Allocation Graph(core topic)**
- **Methods for Handling Deadlocks**
  - **Deadlock Prevention**
  - **Deadlock Avoidance**
    - **Banker's algorithm (core topic)**
- **Deadlock Detection**
- **Recovery from Deadlock**

- **Q: 7.11, 7.12**
- **Q: Deadlock:**
  - **What are the four necessary conditions for deadlock?**
  - **Why are these four conditions necessary, but not sufficient?**
- **Q: CPU Scheduling:**
  - **Explain why Round-Robin scheduling tends to favor CPU bound processes over I/O bound ones.**
- **CPU scheduling quanta have remained about the same over the past 20 years, but processors are now over 1,000 times faster. Why haven't CPU scheduling quanta changed?**
- **List 4 events that might occur to cause the kernel to context switch from one user process to another.**

Memory Management

- **Memory fragmentation (core concept)**
  - **Internal**
  - **external**
- **Paging (core topic)**
- **Page Table Structure (core topic)**
- **Segmentation**

- **Q: Explain the difference between internal and external fragmentation.**
- **Q: Consider the following process for generating binaries. A compiler is used to generate the object code for individual modules, and a linkage editor is used to combine multiple object modules into a single program binary. How does the linkage editor change the binding of instructions and data to memory addresses? What information needs to be passed from the compiler to the linkage editor to facilitate the memory binding tasks of the linkage editor?**
- **Q: Compare paging with segmentation with respect to the amount of memory required by the address translation structures in order to convert virtual addresses to physical addresses.**

- Explain how virtual memory schemes serve to protect memory from unauthorized access.
- **Q: Consider a paging system with the page table stored in memory.**
- **a. If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?**
- **b. If we add associative registers, and 75 percent of all page-table references are found in the associative registers, what is the effective memory reference time? (Assume that finding a page-table entry in the associative registers takes zero time, if the entry is there).**