Review questions for final

Functional programming

1. What is a side effect, and why do functional languages avoid them?

2. Give an example of how control flow is different in functional languages (particularly in Haskell). What type of statements in standard programming languages are not allowed in functional languages?

3. What is a higher order function? What is a first class object?

4. How is I/O accommodated in functional programming languages, since it is pretty much purely based on side effects?

5. What is a functor in Haskell?

6. How are types different in Haskell? Describe its type classes, and how they are different from object oriented classes.

Prolog

7. What is unification, and how does Prolog attempt to do it?

8. How is a variable represented in Prolog? How are clauses formed?

9. Does the ordering of the clauses in a database matter in Prolog? Why or why not?

10. What is the cut (!) in prolog?

Concurrency

11. Why have parallel algorithm and multiprocessor support become so important in the last 20 years? (Give at least 2 reasons.)

12. What is the coherence problem in multiprocessor caches?

13. What is a race condition?

14. What is a context switch?

15. What are the six principal operations that programming languages use to create new threads?

16. Why don't message passing programs require explicit synchronization?

17. What is a barrier, and what types of programs use them?

18. What is a semaphore? Describe what operations are supported.

19. Why are monitors and condition critical regions used in some languages?

Scripting Languages

20. How and when did shell scripts evolve? What programming control structures are available in shell scripts?

21. List the principal features of scripting languages and how they differ from "conventional" languages.

22. What are the two principal ancestors of modern scripting languages?

23. What are regular expressions and extended regular expressions? (May be asked to use some or decipher some on test.)

24. What are associative arrays, and how are they used?