This is a sample of the kinds of questions you can expect for the midterm.

1. Determine the order of each of the following growth functions.
   a) $10n^5 + 100n^3 + 1000$
   b) $2^n + 100n^3$
   c) $n^2 \log_2 n$

2. Which of the previous functions will eventually grow fastest?

3. Determine the growth function and the order of the following code fragment:

   ```
   int n = 10;
   int sum = 0;
   for (int i = 1; i < n; ++i) {
       int j = i;
       while (j < n) {
           sum += j;
           j++;
       }
   }
   ```

4. Define: primitive data type

5. Define: abstract data type

6. Briefly (two or three sentences) describe the relationship between a class and an object.
7. We discussed three types of lists (not JAVA implementations of lists). Name them.
   a)
   b)
   c)

8. Pick one of the three ways we learned to implement ordered lists in JAVA (Array, LinkedList, or ArrayList). Give at least one advantage and at least one disadvantage of the implementation you picked.

9. How is a Queue different from a Stack?

10. Explain why a Binary Search can be implemented in $O(\log_2 n)$: