CS1301 Study guide for the Final Exam

There will be 50 short answer questions and 5 questions where you will be asked to write code (methods and classes).

For the last 5 questions, you are expected to memorize Java syntax and be able to solve simple problems using Java programming.

I recommend you go through the slides at least once. Below are a few recommendations about the things you should understand/know/be able to do for this test. Some of these items may not appear on the actual test.

1. Understand the basic components of a computer.
2. Know what the CPU (central processing unit) is.
3. Know what unit computer speed is measured with. (Hertz)
4. Know what a byte is and how many bits one byte has. (Basic unit of storage, 8 bits to a byte)
5. Understand the difference between primary and secondary storage. (primary->faster, volatile)
6. Know the types of errors a programmer can run into. (logic, syntax, runtime)
7. Understand the difference between interpreted and compiled languages. (line-by-line, all to machine code at once)
8. Know the basic anatomy of a Java program, any character is fair game for the test.
9. Know the keywords we covered in programs so far. (including: this, null, static, public, etc.)
10. Understand what a design, or pseudocode is and how it is different from code.
11. Know the data types we covered in class.
12. Know the syntax of a type cast. (e.g.: int x = (int) someDoubleVariable; )
13. Know how many possible whole, unsigned numbers can be represented by a given number of bits. Power of 2, e.g.: with 8 bits we can represent 2^8 = 256 numbers)
14. Know the rules of identifier naming!
15. Understand what selection statements are. (if, switch)
16. Know what a boolean type is. What can it represent? How many bits does it need? True/False, 1
17. Be able to write a complete simple design and Java program on paper.
18. Know the syntax to create a Scanner object, and get input from the user.
19. Know how to use scanner object to get a double (Scanner's .nextDouble() method) .
20. Know the syntax to print a line using string literals and variables.
21. Know what a relational operator is and give an example. (<= or >)
22. Understand if statements and be able to use them.
23. Be able to point out logic errors in code if(condition); {code;}, the semicolon ends the if statement, so {code;} will execute no matter what condition evaluates to.
24. Know the difference between = and ==
25. Know truth tables for ! (not), && (and), || (or)
26. Be able to write a switch statement.
27. Know what the conditional operator is and how to use it
28. Understand operator precedence and associativity
29. Name at least 3 functions from the math library
30. Know what abs, floor, ceil and round do
31. Know how typecasting works
32. Know what ASCII and Unicode are (character to number, number to character maps)
33. Know what escape sequences are and remember \n and \t.
34. Know what a character type is
35. Know what a String type is
36. Understand the String .charAt method
37. Know what parsing means
38. Know what string formatting specifiers are, e.g.: what %.2f does in printf(“%.2f”, float\_nr)
39. Understand for and while loops
40. Be able to trace throuh the execution of a loop
41. Know what a sentinel value is
42. Know how to write a nested for loop to compute multiplication table
43. Know Java syntax to define a method
44. Know the difference between parameters and arguments
45. Know how to invoke/call a method
46. Know what a return value is and the return statement
47. Know what the void return type is
48. Understand the call stack (data structure used to keep track of active function calls)
49. Know what passing parameters by value means (copy v. passing a pointer)
50. Know what method overloading, and be able to show an example
51. Understand variable scope (existence and lifespan depending on where it was declared).
52. Be able to define what an array is
53. Be able to write syntax to declare and creatre arrays
54. Know how to find the length of an array
55. Know what passing by reference means and that arrays are passed by reference in Java
56. Know how to copy an array
57. Be able to write code to search an array (linear search)
58. Be able to define OOP (Object Oriented Programming)
59. Know the difference between a class and an object.
60. Know how to define a class.
61. Know what constructors are, when they are invoked.
62. Know what an object's state consists of.
63. Know what an object's behavior is defined by.
64. Know what a no-arg constructor is.
65. Know that constructors do not have a return type.
66. Know syntax to declare an object reference variable. (ClassName objectReferenceVariable;)
67. Know how to simultaneously declare and create an object. (ClassName vName = new ClassName(); )
68. What the null literal is and when it is used.
69. Know what instance variables and instance methods are.
70. Know the difference between static and instance variables/methods.
71. Know what visibility modifiers do.
72. Know what mutator/accessor methods are.
73. Know what makes a class immutable.
74. Be able to write methods with various return types and parameters.
75. Be able to implement linear search.
76. Be able to write a complete class with properties, accessors/getters, various visibility modifiers.