CSI33 Final Exam Review Questions Name:

|  |  |  |
| --- | --- | --- |
| Number | Question | Answer |
| 1. | A tree is a natural representation of   1. Arbitrarily interconnected data 2. Linear data 3. Hierarchical data 4. Sappy data |  |
| 2. | Which of the following orders will produce a binary search tree with the best search times?   1. Inserting the items in random order 2. Inserting the items in increasing order 3. Inserting the items in decreasing order 4. All will result in the same search time |  |
| 3. | What is the maximum number of items in a binary tree with a height of 5?   1. 5 b) 31 c) 32 d) 63 |  |
| 4. | If a C++ function uses a variable that has not been declared, what happens?   1. The function will not compile. 2. When executing the function, an error message will be generated. 3. The program crashes. 4. None of the above |  |
| 5. | What is the main purpose of a header file in C++?   1. To comment the code in a source file 2. To declare items so they can be used in C++ source files 3. To define items so they can be used in C++ source files 4. None of the above |  |
| 6. | The scope of a variable refers to   1. The different values it can hold 2. Where the variable can be accessed 3. The time during which memory is allocated for the variable. 4. The names of the variables |  |
| 7. | Members of a class that are declared private may be accessed   1. Only by methods of the class 2. Only by methods of the class or friends of the class 3. Only be methods of the class, subclasses of the class, or friends of the class 4. By any code |  |
| 8. | Members of a class that are declared public may be accessed   1. Only by methods of the class 2. Only by methods of the class or friends of the class 3. Only by methods of the class, subclasses of the class, or friends of the class 4. By any code |  |
| 9. | How can C++ operators be written?   1. They can only be written as members of a class. 2. They can only be written as stand-alone functions. 3. They can be written as either members of a class or as stand-alone functions. 4. Some can only be written as functions while many can be written as class methods or as stand-alone functions. |  |
| 10. | C++ class variables are declared by   1. Using the keyword class before the variable type. 2. Using the keyword static before the variable type 3. Putting them in the header file, but after the ending brace for the class 4. Declaring them inside the constructor |  |
| 11. | What, if anything, is wrong with the following C++ code fragment?  int x, \*y  y = &x;  delete y;   1. The code fragment is correct. 2. The code fragment has a memory leak. 3. The assignment y = &x is incorrect. 4. The statement delete y is incorrect since the address it points to was not allocated with the new operator. |  |
| 12. | 1. What, if anything, is wrong with the following C++ code fragment?   int \*b, \*c;  b = new int;  \*b = 3;  c = b;  delete c;  delete b;   1. The code fragment is correct. 2. The code fragment has a memory leak. 3. The statement delete b deletes the same memory location that was already deallocated by the statement delete c. 4. The first statement must be delete b since the memory was allocated for the variable b. |  |
| 13. | Which of the following are true of the this pointer in C++ classes?  a) You must declare the this pointer as a parameter for methods that want to access it.  b) You can use the this pointer in static/class methods.  c) The this pointer stores the address of the instance of the class with which the method was called  d) You must always use the this pointer to access private data. |  |
| 14. | The most eﬃcient possible running time of a deep copy method for the LList class would be  a) Θ(1).  b) Θ(*log*2*n*).  c) Θ(*n*).  d) Θ(*n*2). |  |
| 15. | A linked implementation of a list   1. will always require more memory than an array version of the same list. 2. will always require less memory than an array version of the same list. 3. may require less memory than an array version of the list depending on the data type (both store the same data type). 4. may require more memory than an array version of the list depending on the data type (both store the same data type). |  |
| 16. | When you write a template function,   * 1. the compiler generates one set of machine language instructions for all types.   2. the compiler generates a separate set of machine language instructions for each type that you call the template function with.   3. the compiler generates a separate set of machine language instructions for every built-in type and every class your program uses whether or not the template function is called with each type.   4. the C++ run-time environment generates the machine language instructions as needed when the function is called with diﬀerent types. |  |
| 17. | A function with two loops has an asymptotic running time of   1. Θ(*log*2*n*) 2. Θ(*n*) 3. Θ(*n*2) 4. not enough information to determine. |  |
| 18 | * How do you distinguish between instance variables and local variables for a method?   + 1. instance variables are part of the data for a particular object and are needed in multiple methods while local variables are needed only within that method     2. a class should never use local variables; all variables used in methods should be instance variables     3. a class should never use instance variables; all variables used in methods should be local variables     4. instance variables should be used for constants only |  |
| 19. | * Which of the following is not true of Python lists?   1. They are implemented underneath as contiguous arrays.   2. All of the items in a list must be of the same type.   3. They can grow and shrink dynamically.   4. They allow for eﬃcient random access. |  |
| 20. | * Which of the following is a Θ(*n*) operation?   1. Appending to the end of a Python list.   2. Sorting a list with selection sort.   3. Deleting an item from the middle of a Python list.   4. Finding the *i*th item in a Python list. |  |
|  |  |  |