

**CS 280**  
**Final Exam Example**

**Total Points: 60**

- I. (12 points, 1 point each) True/False Questions:** For each of the following, write **T** if the statement is true and **F** if it is false. You must use **T** or **F**. Do not use x's or check marks they will be counted as wrong answers.

	Statement	T/F
1	In C++ and Java, it is possible to create an infinite loop out of while and do loops but not for loops.	F
2	The function header <code>void SomeFunc(char arr[]);</code> can be interchangeable with the heading <code>void SomeFunc(char* arr);</code>	T
3	The binding of actual parameters to formal parameters in C/C++ is by position.	T
4	The <i>Environment Pointer</i> (EP) is a variable maintained by the run-time system. It always points at the base of the activation record instance of the currently executing program unit.	T
5	C++ supports multiple inheritance, but Java directly supports only single inheritance.	T
6	C++ provides two constructs, the class and the struct, which support directly abstract data types.	T
7	The type of the reference, not the type of the object, is used to determine which version of a method is invoked in a polymorphic reference.	F
8	A C++ class that has at least one virtual function is an <i>abstract class</i> .	F
9	A switch statement in C++ or Java must have a default clause.	F
10	In Java, all objects are allocated from the heap and accessed through reference variables.	T
11	C++ private class members are not accessible by friend functions or friend classes	F
12	No default parameters in C++ are possible, because actual and formal parameters are associated by position.	F

- II. (48 points, 2 points each) Multiple Choice Questions:** Circle one of the given choices for the answer of each question.

1. What are the values of x, y and z after the execution of the following statements?

```
int x = 3;
int y = ++x;
int z = x++;
```

- a. x = 4, y = 4, z = 3
- b. x = 5, y = 4, z = 4**
- c. x = 4, y = 3, z = 3
- d. x = 5, y = 3, z = 4

2. Consider the following C++ program, what is the output generated in the main function, assuming operands are evaluated left to right in the statement at position 1?

```
int fun (int x, int &y)
{
    ++x;
    y++;
    return x;
}

int main()
{
    int k = 3, j = 11;
    do {
        j = j - fun(k, j); //position 1
        cout << k << ", " << j << ", ";
    } while(++k < 5);

    return 0;
}
```

- a. 3, 7, 5, 2,
- b. 4, 7, 5, 2,
- c. 3, 7, 4, 2,**
- d. 4, 8, 5, 4,

3. Assume that we have the following declarations.

```
int i= 10, j= 4;
double m= 2, n= 4;
```

Precedence	Highest	Unary +, unary -
		*, /, %

		+ (add), - (subtract)
	Lowest	= (assignment)

Using the given table of partial precedence rules, evaluate the following expression, assuming associativity is left to right.

$i = i \% j - i * j / (m - i) + m;$

- a. 9
- b. -1
- c. 8
- d. 12

4. What will be the value of **x** after the following statements are executed?

```
int x = 12;
switch (x)
{
    case 10:
        x += 15;
        break;
    case 12:
        x -= 5;
    default:
        x *= 3;
}
```

- a. 15
- b. 21
- c. 27
- d. 7

5. Individual entities in Java classes have access control modifiers, called visibility modifiers, that are attached to method and variable definitions. These include:

- a. public, private
- b. public, private, protected
- c. public, private, protected, final
- d. public, private, protected, static

6. A continue statement in C/C++ and Java
- a. may be used within a while or a do-while loop but not a for loop
  - b. is identical to a break statement within loops
  - c. may be used within any loop statement
  - d. may be used within a for loop but not within a while or a do-while loop
7. The parameter profile or signature of a subprogram contains
- a. the number, type, and order of parameters.
  - b. the return type, along with the number, type, and order of parameters.
  - c. the number, and order of parameters
  - d. the return type and the method name

8. Given the following C++ function definition:

```
void MyFun(float x, const double &y, int *z);
```

What are the passing modes of the parameters x, y, and z?

- a. x is IN, y and z are INOUT.
  - b. x and y are IN, and z is INOUT
  - c. x and z are OUT, and y is IN.
  - d. x and y are INOUT, and z is OUT.
9. Consider the following C++ class definitions:

```
class AClass{  
    private:  
    int a;  
    protected:  
    float b;  
    public:  
    double c;  
};  
class BClass: private AClass{ . . . };
```

BClass is a private-derived class of AClass. What are the access controls of the inherited data members b, and c in BClass?

- a. b is protected and c is public
- b. b and c are protected
- c. b and c are private
- d. b and c are public

10. Inheritance through class derivation provides support to which of the following concepts?

- a. modularity
- b. information hiding
- c. code reuse
- d. correctness

11. Given the following C++ partial class definition:

```
class A1
{
    Private: int y;
    Protected: int z;
    Public:
        int x;

    ...
}
class A2: public A1
{
    protected int a;
    private int b;
    ...
}
class A3: public A2
{
    private int q;
    ...
}
```

Which one of the following options is the list of data members that are accessible in class A3?

- a. x, y, z, a, b, q
- b. a, b, q
- c. x, z, a, q
- d. x, a, q

12. Given the following class definitions and main function:

```
class Person{
```

```

    public:
        virtual double getMoney(){return 7.25; }
};

class Student:public Person{
    public:
        virtual double getMoney(){ return 2.5;}
};

class Employee:public Person{
    public:
        virtual double getMoney(){return 4.5; }
};

int main(){
    Person * p[3] = {new Student(), new Employee(), new Person()};

    for (int i = 0; i < 3; i++ ) {
        cout << p[i]->getMoney()<< " ";
    }
}

```

What is the displayed output?

- a. 2.5 4.5 7.25
- b. 7.25 7.25 7.25
- c. 7.25 2.5 4.5
- d. 2.5 7.25 4.5

13. A class in C++ that includes a \_\_\_\_\_ function is an abstract class.

- a. pure virtual
- b. protected
- c. virtual
- d. public

14. A constructor is a method that

- a. returns an object of the class
- b. never receives any arguments
- c. performs initialization or setup operations
- d. removes the object from memory

15. Who does the saving of the execution status (i.e., machine state), the caller or the called subprogram?

- a. Caller subprogram.
- b. Called subprogram.
- c. Both the caller and called subprograms.
- d. Operating system.

16. Activating a subprogram requires the dynamic creation of an instance of the activation record for the subprogram. From where storage is allocated for a subprogram activation record instance?

- a. Run-time stack.
- b. Heap.
- c. Data segment.
- d. All of the above.

17. Consider the following program written in C syntax, what are the values of the *list* array after the call to *fun* function?

```
void fun (int& first, int &second){
    first += first + second;
    second += second + first;
}

int main(){
    int list [] = {1, 3};

    fun(list[0], list[1]);
    cout << list[0] << " " << list[1] << endl;
}
```

- a. {1, 3}
- b. {2, 6}
- c. {5, 11}
- d. {4, 4}

18. In Java, all passed parameters of scalar types are passed

- a. By-value
- b. By-reference
- c. By-value-result
- d. By-result

19. Using the given table of partial precedence rules and associativity in C++,

Precedence	Highest	Postfix ++, postfix --	Left-to-right
		Unary +, unary -, prefix ++, prefix --	Right-to-left
		*, /, %	Left-to-right
		+ (add), - (subtract)	Left-to-right
	Lowest	= (assignment), +=	Right-to-left

What is the value of `result` assuming that we have the following declarations?

```
int count = 4, result=1;

result += -++count * 2;
```

- a. -6
- b. -8
- c. -7
- d. -9

20. Given the following C++ declarations.

```
int val = 2;
float res = 3.5;
```

Indicate which of the following operations is a narrowing type conversion.

- a. `val = res;`
- b. `res = val;`
- c. `(float) val`
- d. `(double) res`



21. When a method in Java is declared with the \_\_\_\_\_ modifier, it cannot be overridden in a subclass.

- a. public
- b. protected
- c. final
- d. void

22. What is the output of this code sequence?

```
double arr[4] = { 18.6, 8.2, 12.3, 65.8};
double temp = arr[0];
for (int i = 1; i < 4; i++)
{
    if(arr[i] > temp)
        continue;
    else
        temp = arr[i];
    cout<< temp << " ";
}
```

- a. 8.2 12.3 12.3
- b. 8.2
- c. 8.2 8.2 8.2
- d. 8.2 12.3

23. From where are C++ class instances allocated?

- a. Run-time stack
- b. Heap
- c. Data Segment
- d. All of the above

24. How is a local variable location in an activation record determined in the run-time stack?

- a. Using the variable's offset address.
- b. Using the address computed by adding the variable's offset to the top of stack pointer (i.e., stack pointer + offset).
- c. Using the address computed by adding the variable's offset to the environment Pointer (i.e., EP + offset).
- d. Using the address computed by adding the variable's offset to the Dynamic Link pointer (i.e., Dynamic Link + offset).