1. Consider the languages C and Java. State the date (or decade) of release for each of those languages. (2 points)

1. Clearly justify the claim that Java is an improvement over C, regardless of language target area. (4 points)

2. Choose a programming paradigm:____________________________. Answer the following:
   
a. Programming language using such paradigm:________________________(2 points)
   
b. Model of computation used by paradigm:(2 points)
   
c. Programming methodology to be used with the paradigm.(2 points)
   
d. Program reliability using such paradigm.(2 points)
3. Consider the following factors dealing with expressions: form of writing, evaluation time, evaluation order. For each below, name each factor that impacts it, positively or negatively, explaining why:

a. readability (2 points)

b. writeability (2 points)

c. program efficiency (2 points)

4.

a. Define binding (3 points)

b. List all binding times for entities in a PL; for each, give an example of the entity and the attribute being bounded. Continue writing your answer on the back of this page if needed. (10 points)
5.
   a. define scope. (2 points)

   b. define static scope, and state the number of regions associated with an entity using static scope. (4 points)

   c. define dynamic scope and state the number of regions associated with an entity using dynamic scope. (4 points)

   d. Give and trace (using the stack) a complete programming example using each of the two scope methods; the program ought to give different answers based on the scope used. (10 points)
6. 
   a. what is an activation record? (2 points)

   b. what does an activation record contain? (6 points)

   c. what is a function closure? (3 points)

   d. Explain how method execution is managed by the run-time system; and explain how the run-time system enforces the scope discipline used by the language (6 points)

7. List and explain the trade-off of static and dynamic scope methods. (4 points)

8. Define the two semantical meanings found for variables, and discuss their trade-off. (6 points)
9. For each of the storage methods available: (18 points)
   a. Define it. (2 points)
   b. Name language that uses that method. (1 point)
   c. State the trade-off of the method. (3 points)

10. Give a complete piece of code in your favorite language illustrating all the memory allocation methods. (6 points)
11.  
   a. List all the memory partitions made during while a program is executing. (3 points)

   b. Name the storage mechanism supported by each of those regions. (3 points)

   c. Could statically allocated memory be allocated in the stack or in the heap? why or why not? (2 points)

12.  
   a. Evaluate Perl as a programming language using the 3 language design factors as well as its pragmatics. (This is the question: is Perl a programming language?) If you cannot evaluate Perl, evaluate your favorite language. (6 points)

   b. In the code below, name the parameter passing method(s) that produced: “The answer is 9” (6 points)

```c
int x = 10;
int f1 (int y) {
    x = x + 1;
    y = y - 1;
    return x + y;
}
int z = f1(x);
printf("The answer is " + x);
```