CS213 “MIDTERM” (462)

Question 1) Multiple choice question (5 Pts)

a) Write a function in Scheme to sum two numbers and display the average.

_____

_____

_____

_____

b) Complete with a suitable sentence:

1. Fortran It was primarily used for _____ applications.

2. In LISP, the syntax is based on _____ expressions.

3. Prolog is based on _____.

4. Java eliminated many unsafe features of _____.

Question 2) Write the output of each of the following Scheme statements: (5 Pts)

- (cons 'A '(B C)) returns _____
- (EQ? 'Cc 'CC) returns _____
- (CDR '(X)) returns _____
- (+ (- 12 2) 30) returns _____
- (EQ? 'Z '(Z)) returns _____
- (CAR '((A B) C D)) returns _____
- (CAR '(A)) returns _____
- (LIST? (CDR '(A F R))) : returns _____
- (length '((e s r) a g (b c) (k r) d)): returns _____
- [1, 8, 3] ++ [5, 9], the result is: _____

Question 3) (5 pts)

a) Compilation process has several phases, define the difference between lexical analysis and syntax analysis:

b) Define what is Orthogonality in a programming language means:

Question 4) (5 pts)

Describe the differences between a compiler, an interpreter, and a hybrid implementation system. Discuss when each method is used, and order them based on execution speed from fastest to slowest:

Question 5) Imperative Programming Language (5 pts)

Translate the following C function exactly to Pascal and Scheme, use the same variables and names:

```
int fib (int n)
{
  if ((n == 1) || (n == 2))
    return 1;
  else
    return fib(n-1) + fib(n-2);
}
```

To Pascal:

To Scheme:

With best wishes