BBM 301 - Programming Languages - Fall 2020 Midterm
December 1, 2020 – Part 3

Name: _____

Student ID number: _____

Please write your name, ID and following honor pledge:
"**On my honor, I pledge that I have neither given nor received any unauthorized assistance on this exam.** "
and **sign** your answer sheet.

Question 5: 25 points, 25 mins.

a) [13 points] Write a Scheme function named `checkOrderedPairs` which takes a predicate function and a simple list as parameters, and returns the number of pairs that satisfy the given predicate function. The predicate must accept two elements as its arguments and should process the pairs according to their order. Note that you should only process the pairs in given order, for example, if the input is (3 5 7 8), the pairs to process will be (3,5),(3 7),(3 8),(5,7),(5,8) and (7,8).

Here are some example calls and the corresponding outputs:

```
> (checkOrderedPairs equal? '(a b c b a))
2
> (checkOrderedPairs equal? '(a b c d e))
0
> (checkOrderedPairs < '(2 16 5 8 4))
5
```

b) [12 points] Write a Scheme function named `countEvenNumbers`, which counts the even numbers at every level of a given list. Here are some example calls and their outputs:

```
> (countEvenNumbers '())
0
> (countEvenNumbers '(2 5))
1
> (countEvenNumbers '(1 2 (4 8) 10))
4
> (countEvenNumbers '(1 3 (a b (4 5 (6)))))
2
```