Name _____; Roll no. _____; Section A; Group ____.

CSE 101 Introduction to Programming Section A Quiz 2, Nov 3, 2023

Instructions: There are 5 problems, each of 6 marks, for a total 30 marks. The total time allowed is 30 min.

1. A price list of products sold is given in the form of a **dictionary** where the price of an individual product is given as `'item': (price, discount, gst)`. The price is in Rupees, and discount and gst are given as percentage. E.g.

   `Price_List = {'car': (9, 10, 12), 'teddy': (20, 10, 12), 'shirt': (9, 15, 6), etc. etc. }.`

   To be sure, and in particular, above a 'teddy' is priced at Rs. 20, with a discount of 10%, and GST of 12% applied after the discount is availed, the final price is Rs. 20.16 (check).

   Rewrite the function (below) in Python that will compute and return the final price a customer will have to pay to buy one piece of one product, given the Price_List.

```
def final_item_price(formal parameters):
    # Rewrite below the function with appropriate list of formal parameters, and
    # these lines replaced with one or more executable statements to complete this function
```

Correct answer:

```
def final_item_price(PL, item):
    price = PL[item][0]
    price -= price*PL[item][1]/100
    price += price*PL[item][2]/100
    return(price)
# optionally
Price_List = {'car': (9, 10, 12), 'teddy': (20, 10, 12), 'shirt': (9, 15, 6)}
print(final_item_price(Price_List, 'teddy'))
```

1 point ← def line
3 points
1 point
overall 6 points

2. This question has to do with aliasing. Consider the following Python code, and conclude whether the function correctly determines if the list of elements in the list x is a 'palindrome', and if NOT, why is that so. Give your answer here.

   Correct answer:

   NO. In all cases this program will yield the **answer TRUE, since temp and x have been aliased**, and irrespective using temp.reverse statement temp == x.

```
def isPal(x):
    temp = x
    temp.reverse
    if temp == x:
        return True
    else:
        return False
L = [1, 5, 45, 5, 2]
print(isPal(L))
```

6 points

3. We are given a Python code to Bubblesort a list. Here it is:

```
# Bubbelsort a list of integers
def bubblesort():
    global L
    for j in range(len(L)-1, 0, -1):
        bubbledown(0, j)
def bubbledown(lo, hi):
    global L
    for k in range(lo, hi):
        if L[k] > L[k+1]:
            temp = L[k]
            L[k] = L[k+1]
            L[k+1] = temp
    print('hi = ', hi, 'lo = ', lo, 'List = ', L)
global L
L = [2, 65, 34, 24, 17]
```

`bubblesort()`

What is output for the particular case when `L = [2, 65, 34, 24, 17]`? Give your answer here:

Correct answer:
hi = 4 lo = 0 List = [2, 34, 24, 17, 65]
hi = 3 lo = 0 List = [2, 24, 17, 34, 65]
hi = 2 lo = 0 List = [2, 17, 24, 34, 65]
hi = 1 lo = 0 List = [2, 17, 24, 34, 65]

$1\frac{1}{2}$ points each $\Rightarrow$ 6 points

4. We like to prove that $f(n) = c_3*n^3 + c_2*n^2 + c_1*n + c_0 = O(n^3)$. That is, can we come up with a C and an $n_0 > 0$ such that $C*n^3 > f(n)$ for all $n > n_0$? Note it does not matter how large C is, or how large n_0 is. Can you suggest a C and an $n_0 > 0$? **Write your answer here:**

Correct answer
$C = abs(c_3) + abs(c_2) + abs(c_1) + abs(c_0)$ ← 4 points
$n_0 = 1$ ← n_0 can be anything ~~above~~ ≥ 1 2 points
total 6 points

5. We are given below a Python program to identify all words in a given sentence/paragraph. For instance, the program prints the list `['now', 'you', 'are', 'required', 'to', 'write', 'a', 'python', 'program']` for the test case **text = 'Now, you are required to write a Python program'.**
I have introduced 3 bugs in the program. Can you identify them? One is a simple syntax error. The other two point to error in logic of the program.

```
def words(text):
    word_list = []
    i = 0
    while i < len(text):
        word = ''
        for j in range(i, len(text)):
            if text[j] in 'abcdefghijklmnopqrstuvwxyz':
                word = word + text[j]
            else:
                break
        word_list.append(word)
        j = j+1
        while j < len(text) and text[j] not in 'abcdefghijklmnopqrstuvwxyz':
            j = j+1
        i = j
    return(word_list)
text = 'Now, you are required to write a Python program'
text = text.lower()
print(text)
print(words(text))
```

misspelled

Question 5 stands withdrawn. It is not to be graded. The quiz will be graded out of 24, not 30.