WORKSHEET FOR UNIT TEST 1

(REVIEW OF PYTHON & FUNCTIONS)

Review of Python

NOTE: Please THOROUGHLY read all answers before writing. There is stuff you are not supposed to copy!!

1. What are the possible outcome(s) executed from the following code? Also specify the maximum and minimum values that can be assigned to variable `NUMBER`:

```
STRING = "CBSEONLINE"
NUMBER = random.randint(0,3)
N = 9
while STRING[N] != 'L':
      print(STRING[N]+STRING[NUMBER]+'#',end='')
      NUMBER = NUMBER+1
      N = N-1
```

Answer: # R belongs to M factorial: randint uses closed interval

Maximum Value of `NUMBER` = 3, Minimum Value of `NUMBER` = 0,
(i) and (iv) are possible outcomes

(i) ES#NE#IO#
(ii) LE#NO#ON#
(iii) NS#IE#LO#
(iv) EC#NB#IS#

2. Write the output of the following Python program code: (oh I hate it when they insert screenshots for questions)

```
Data = ['D','o',' ','I','t',' ','@',' ','1','2','3',' ','!']
for i in range(len(Data)-1):
    if (Data[i].isupper()):
        Data[i]=Data[i].lower()
    elif (Data[i].isspace()):
        Data[i]=Data[i+1]
print(Data)
```

Answer: # Spaces changed to element next to it; Uppercase to lowercase

```
['d', 'o', 'I', 'i', 't', '@', '@', '1', '1', '2', '3', '!',
'!']
```

3. Find and write the output of the following Python code:

Answer: Runs 8 times, if character between A and M, assign next character in place, if character is digit, assign previous character in place. For everything else, replace with *

X*M2M201

```
Str1 = "EXAM2018"
Str2 = ""
I = 0
while I < len(Str1):
      if Str1[I]>="A" and Str1[I]<="M":
            Str2 = Str2 + Str1[I+1]
      elif Str1[I]>="0" and Str1[I]<="9":
            Str2 = Str2 + Str1[I-1]
      else:
            Str2 = Str2 + "*"
      I=I+1
print(Str2)
```

4. How many times will Python execute the code inside the following while loop?

Answer: 14 (2^{14} = 16384 > 10000 = loop break)

```
i = 1
while i < 10000 and i > 0 and 1:
      print(“Hello ...”)
      i = 2 * i
```

5. `_Cost, Price*Qty, float, switch, Address one, Delete, Number12, do`

Which of these cannot be used for naming variables or functions in a python program?

Answer: `Price*Qty, Address one` (Contains Space) (float, switch, do and Delete are not keywords in python)

6. Convert the following while loop into for loop:

```
i = 0
while i < 100:
      if i % 2 == 0:
            print(i, “is even”)
      else:
            print(i, “is odd”)
      i = i + 1
```

Answer:

```
i = 0
for i in range(0,101):
      if i % 2 == 0:
            print(i, “is even”)
      else:
            print(i, “is odd”)
```

7. Give the output of following with justification:

```
x = 3
x += x-x
print(x)
```

Answer: 3

The expression x += x-x translates to x = x + (x-x)

Since x-x = 0, the result is x, unchanged

8. Write the output for the following program:

```
mydict = {'a':27,'b':43,'c':25,'d':30}
vala = ' '
for i in mydict:
      if i > vala:
            vala = i
            valb = mydict[i]
print(vala)
print(valb)
print(30 in mydict)
mylst = [ ]
mylst = (mydict.keys())
print(mylist) # seriously?
```

Answer: (Correcting last line,)

```
d
30
False
dict_keys(['a', 'b', 'c', 'd'])
```

Remember the format of this last line! IT IS NOT A LIST AND THUS IS NOT ITERABLE USING INDEXING! (so is dict_items)

9. Write a nested list comprehension statement to find the transpose of the given matrix, `mat=[[12,24],[13,26],[14,28],[15,30]]` and also find the output for the given statement `print(mat[1:][1:],mat[:2][1:])`

Answer: The transpose of a matrix is found by interchanging its rows into columns or columns into rows.

```
matT = [[mat[j][i] for j in range(len(mat))] for i in range(len(mat[0]))]
```

Output for the given statement: `[[14, 28], [15, 30]] [[13, 26]]`

10. What is the output of the following?

```
x=[]
for i in range(3):
      x.append(x.append(i))
print(x)
```

Answer:

```
[0, None, 1, None, 2, None]
```

11. Write a Python Program to Generate a Dictionary that Contains Numbers (between 1 and n) in the Form (x,x*x).

Answer:

```
n = int(input("Enter number: "))
D = {}
for i in range(1,n+1):
      D[i] = (i)**2
print(D)
```

12. Write a Python program to create a dictionary whose keys are employee names and whose values are salary of the employee and display all the employee names who are getting less than 30000.

Answer:

```
c = 'y'
D = {}
while c=='y':
      k = input('Enter Emp Name: ')
      D[k] = int(input('Enter Emp Salary: '))
      c = input('Continue? (y/n) ')
print('Employees earning less than 30000 as salary')
for i in dict.items(D):
      if i[1]<30000:
            print(i[0])
```

13. Find the output of the following code:

```
tup1 = (1,(2,(3,(4,))))
print(len(tup1))
tup2 = (1,(2,(3,),4),5)
print(len(tup2))
```

Answer:

2

3

14. Are these values equal? Why/Why not?

(i) 20 and 20.0
(ii) 20 and int(20)
(iii) str(20) and str(20.0)
(iv) 'a' and "a"

Answer:

(i) Yes, both are of same value
(ii) Yes, both are of same value
(iii) No, the characters of the strings are not identical
(iv) Yes, different quotations do not affect the content of the string

15. Add Parentheses to the following expressions to make the order of evaluation more clear. (idhellam kelviya)

```
((Y%4==0 and Y%100!=0) or Y%400==0)
```

Answer: (((Y%4)==0 and (Y%100)!=0) or (Y%400)==0)

actually half the answer is already in the question

16. What will be the output of the code?

```
print(print(“happy2020”))
a=1,3,5
print(a)
```

Answer: (functions run innermost to outermost)

```
happy2020
None
(1, 3, 5)
```

17. What will the following code print?

```
str1=’’’happynewyear\n
2020’’’
str2=’’’happynewyear\
2020’’’
print(len(str1)>len(str2))
```

Answer: (len(str1)=18, len(str2)=16 FOR THIS FORMATTING SPECIFICALLY →)

The reason why the formatting is changed is because there is no way to count the number of spaces properly. There seems to be one less space in str2 in the original, but the output remains unchanged. The core concept is the working of docstring.

Output: `True`

18. Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code:

```
L=['a', 'b', 'c', 'd']
D=5
For I in len(L):
      L[i]+=D
      D=D-1
      print(D,L)
# insert funny dextro laevo
optical isomerism joke
```

Answer:

```
L = ['a', 'b', 'c', 'd']
D = 5
for i in len(L):
      L[i] += ‘D’
      D = D-1
      print(D,L)
```

19. How many times the word "India" printed in the following statement? (“statement”)

Answer: 5 times

```
S="Python Rocks"
for ch in S[3:8]:
      print("India")
```

20. Write a program in python which add the elements of a tuple into an existing list such a way that the tuple must be appended with every element of the list to form a nested list.

For example, If the list initially contains [12,45,67,23,78,90] and the tuple contains (1,5,8,9,3) then the resultant list must contains [[12,1,5,8,9,3],[45,1,5,8,9,3],[67,1,5,8,9,3],[23,1,5,8,9,3],[78,1,5,8,9,3],[90,1,5,8,9,3]].

Answer:

```
L = list(eval(input(“Enter list: ”)))
T = tuple(eval(input(“Enter tuple: ”)))
for i in range(len(L)):
      L[i]+=list(T)
print(L)
```

Functions f:py->c

Rapid fire!

1. Function name must be followed by arguments.
2. def keyword is used to define a function.
3. Function will perform its action only when it is called.
4. Write statement to call the function:

```
def Add():
      X = 10 + 20
      print(X)
Add()
```

5. Write statement to call the function.

```
def Add(X,Y):
      Z = X+Y
      return Z
Add(9,10) # answer is obliged to be 21
```

6. Which Line Number Code will never execute?

```
def Check(num):          #Line 1
     if num%2==0:        #Line 2
     print("Hello")      #Line 3
     return True         #Line 4
     print("Bye")        #Line 5
else:                    #Line 6
     return False        #Line 7
C = Check(20)
print(C)
```

Answer: In a python code block, lines after return statement will not be executed. So Line 5 will never be executed.

7. What will be the output of following code?

```
def Cube(n):
     print(n*n*n)
Cube(n) # n is 10 here
print(Cube(n))
```

Answer: `1000`

`None`

8. What are the different types of formal arguments in function? Give example of any one of them.

Answer:

Formal Parameters are of 3 (actually 4 but 3) types: Positional, Default and Keyword arguments.

Ex: `def yeet(thing, at=”myself”):`

`thing` is a Positional argument and `at` is a Default argument

9. What will be the output of following code:

```
def Alter(x, y = 10, z=20):
    sum=x+y+z
    print(sum)
Alter(10,20,30)
Alter(20,30)
Alter(100)
```

Answer:

```
60
70
130
```

10. Ravi a python programmer is working on a project, for some requirement, he has to define a function with name CalculateInterest(), he defined it as:

```
def CalculateInterest(Principal,Rate=.06,Time):
    # code
```

But this code is not working, Can you help Ravi to identify the error in the above function and what is the solution.

Answer:

If Ravi is a python programmer and is working on a project, making mistakes like this, HE IS DRUNK AF AND YOU NEED TO FIRE HIM

Ravi has entered a positional formal argument after a default argument, which is incorrect syntax. The argument `Time` could be positioned before `Rate=.06` to make it work.

11. Call the given function using KEYWORD ARGUMENT with values 100 and 200

```
def Swap(num1,num2):
    num1,num2=num2,num1
    print(num1,num2)
Swap(num2=200,num1=100)
```

12. Which line number of code(s) will not work and why?

```
def Interest(P,R,T=7):
    I = (P*R*T)/100
    print(I)
Interest(20000,.08,15)              #Line 1
Interest(T=10,20000,.075)           #Line 2
Interest(50000,.07)                 #Line 3
Interest(P=10000,R=.06,Time=8)      #Line 4
Interest(80000,T=10)                #Line 5
```

Answer:

Line 2 will not work because positional argument is after the keyword argument

Line 4 will not work because an extra argument that doesn't match any formal argument is passed (unexpected keyword argument)

Line 5 wont work because it is missing the R positional argument

Mothathula indha program la rendu line thaan working partnga

13. What will be the output of following code?

```
def Calculate(A,B,C):
    return A*2, B*2, C*2
val = Calculate(10,12,14)
print(type(val))
print(val)
```

Answer:

```
<class 'tuple'>
(20, 24, 28)
```

14. What do you understand by local and global scope of variables? How can you access a global variable inside the function, if function has a variable with same name.

Answer:

A variable is said to have local scope when it is defined inside a codeblock. It is accessible only within the codeblock. A variable is said to have global scope when it is defined above all the statements in the program. It is accessible throughout the program, even inside code blocks. A global variable can be accessed inside a function definition using the global statement

15. What will be the output of following code?

```
def check():
    num=50
    print(num)
num=100
print(num)
check()
print(num)
```

Answer: (Concept: Scope of variables)

```
100
50
100
```

16. What will be the output of following code?

```
def check():
    global num
    num=1000
    print(num)
num=100
print(num)
check()
print(num)
```

Answer: (Concept: Scope of variables)

```
100
1000
1000
```

17. Function can alter only Mutable data types --- True

18. A Function can call another function or itself --- True

19. What will be the output of following code?

```
def display(s):
    l = len(s)
    m=""
    for i in range(0,l):
        if s[i].isupper():
            m=m+s[i].lower()
        elif s[i].isalpha():
            m=m+s[i].upper()
        elif s[i].isdigit():
            m=m+"$"
        else:
            m=m+"*"
    print(m)
display("EXAM20@cbse.com")
```

Answer: `exam$$*CBSE*COM`

20. What will be the output of following code?

```
def Alter(M,N=50):
    M = M + N
    N = M - N
    print(M,"@",N)
    return M
A=200
B=100
A = Alter(A,B)
print(A,"#",B)
B = Alter(B)
print(A,'@',B)
```

Answer:

```
300 @ 200
300 # 100
150 @ 100
300 @ 150
```

21. What will be the output of following code?

```
X = 50
def Alpha(num1):
     global X
     num1 += X
     X += 20
     num1 = Beta(num1)
     return num1
def Beta(num1):
     global X
     num1 += X
     X += 10
     num1 = Gamma(num1)
     return num1
def Gamma(num1):
     X = 200
     num1 += X
     return num1
num = 100
num = Alpha(num)
print(num,X)
```

Answer: `420 80`

22. What will be the output of following code?

```
def Fun1(mylist):
     for i in range(len(mylist)):
          if mylist[i]%2==0:
               mylist[i]/=2
          else:
               mylist[i]*=2
list1 = [21,20,6,7,9,18,100,50,13]
Fun1(list1)
print(list1)
```

Answer for 22: `[42, 10.0, 3.0, 14, 18, 9.0, 50.0, 25.0, 26]`

23. Write a Python method/function SwitchOver(Val) to swap the even and odd positions of the values in the list Val, Assuming that the list has even number of values in it.

For example : If the list Numbers contain [25,17,19,13,12,15]

After swapping the list content should be displayed as [17,25,13,19,15,12]

Answer:

```
def SwitchOver(Val):
    for i in range(0,len(Val),2):
        Val[i],Val[i+1]=Val[i+1],Val[i]
    print(Val) # "content should be displayed"
```

24. Find the Output:

```
def change(s):
    d = {"UPPER" : 0, "LOWER" : 0 }
    for c in s:
        if c.isupper():
            d["UPPER"] += 1
        elif c.islower():
            d["LOWER"] += 1
        else:
            pass
print("Upper case count :", d["UPPER"])
print("Lower case count :", d["LOWER"])
change("School Days are Happy") # what a pathetic lie
```

Answer:

```
Nice indentation there in the original program, lets fix it by adding
a tab space before the two print() lines and then evaluate it
```

Output:

```
Upper case count : 3
Lower case count : 15
```

25. Declare a dictionary D1 mapping each integer from 0 to 9 with their respective number names. And also define a function NumName(N) that find the number name of N, using the dictionary D1.

Example: If the number passed to the function is 2951, then the string to be returned is "Two Nine Five One"

Answer:

```
D1 = {'x':"ex", 0:"jero", 1:"won", 'CJMA':'andi', 2:"too", 3:"tree", 4:"bor", 5:"bi", 6:"zix", 7:"zevun", 8:"ate", 9:"naina"}

# please copy mindfully!

def NumName(N):
    num,name=str(N),''
    for i in num:
        name+=D1[int(i)]+' '
    return name.title().rstrip() # "the string to be returned"

# title for title case as given in example, rstrip to remove extra space

print(NumName(2951)) # "Too Naina Bi Won" sus 🤔
```

26. Write a function Sum7End(MYLIST), which display only those items from the list which ends from the digit 7, also find total of these elements.

For example, if MYLIST = [10,27,15,107,97,5,7,81,47] The output should be

```
27
107
97
7
47
Total = 285
```

Answer:

```
def Sum7End(L): # write a function so writing only a function
    s=0
    for i in L:
        if i%10==7:
            print(i)
            s+=i
```

27. Write the function SumEvenOdd(MYLIST) to find the sum of all Even elements and sum of all Odd elements present in MYLIST.

For example, if the elements are 8 12 17 19 25 29 33 32 56 90 Output should be:

```
Even Sum = 198 Odd Sum = 123
```

Answer:

```
def SumEvenOdd(L):
    es,os=0,0
    for i in L:
        if i%2==0:
            es+=i
        else:
            os+=i
    print(f"Even Sum = {es} Odd Sum = {os}")
```

28. Write a function copylist(lst1,lst2) in Python, which accepts two lists of numbers and copies the common numbers into third list. Sample Input Data: lst1 = [10,20,30,40,12,11] lst2 = [10,30,40,13,15,76] | Output: `[10,30,40]`

Answer:

```
def copylist(lst1,lst2):
    lstc=[]
    for i in lst1:
        if i in lst2 and i not in lstc: # handling repetition
            lstc+=[i]
    print(lstc)
```

Space

Intentionally

Left

Blank

(summa fun pandrom)

29. Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code.

```
DEF execmain():
    x = int( input("Enter a number:"))
    if (abs(x) = x):
    print"You entered a positive number"
    else:
        x=*-1
    print("Number made positive :",x)
execmain()
```

Answer:

```
def execmain():
    x = int(input("Enter a number:"))
    if (abs(x) == x):
    _____print("You entered a positive number")
    else:
        x*=-1
    print("Number made positive :",x)
execmain()
```

And finally, 30. Write a User Defined function which accepts a string as argument and display the string after replaces all the vowels with "$"

Answer:

```
def mrKrabsSpeak(S):
    S1=""
    for i in S:
        if i.lower() in ['a','e','i','o','u]:
            S1+="$"
        else:
            S1+=I
    return S1
```

Disclaimer:

I, the author, will not be held responsible of any consequences, be it good or bad, due to this document. Some errors may have crept in, so please do not blindly copy the answer. Verify with your compiler/guide.

Note:

Be careful while copying answers! You may accidentally write something that is not meant to be shown to the teacher!

Feedback Required:

Which half of the document was more readable? Which half of the document was less boring to copy? Which half of the document do you think was well formatted? Answer in comments!

Credits for Corrections:

Nihal (Q5)

Ballbouncer69 (Athreya wanted this to be his credit name) (Functions Q30)

Now I understand it is impossible to make errorless documents without 2 or 3 people's support, but the jokes will still continue as it is the signature of projectTitin

20230528_01 Revision changelog:

Fixed 3 answers (Rev. of python Q5, 12 ; Functions Q1, 30)

Fixed string (unimportant, you must not copy the string as is anyways, Rev. of Python Q20)

Added small hints to answers, so that this document is helpful for exam