## Q1

Which of the following star patterns will be generated by the following Python code (Choose A or B or C or D)

```python
n = 10
for i in range(0, n):
  for j in range(0, i+1):
    print(" ", end="")
  for j in range(0,n):
    print("*", end="")
  n = n - 1
  print("\n")
```

```
 **********

  *********

   ********

    *******

     ******

      *****

       ****

        ***

         **

          *
```

## Q2

### Q2.1 List's element is accessed using the [ ] operator, whereas Tuples's element is accessed using the ( ) operator. ( True/False )

Answer: False.

```python
a = [1,2,3]; b = (4,5,6)
print(a[0],b[0])
```

```
1 4
```

### Q2.2 You can append a tuple to a list ( True/False )

Answer: False

```python
a = [1,2,3]
b = a + (4,5,6)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-7-811b3980a55d> in <cell line: 2>()
      1 a = [1,2,3]
----> 2 b = a + (4,5,6)

TypeError: can only concatenate list (not "tuple") to list
```

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### Q2.3 You can concatenate a list with a tuple ( True/False )

Answer: False

```
a = (1,2,3)
b = a + [4,5,6]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-8-bb24e00c18f5> in <cell line: 2>()
      1 a = (1,2,3)
----> 2 b = a + [4,5,6]

TypeError: can only concatenate tuple (not "list") to tuple
```

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## Q2.4 Write the git command to delete a branch with the name ‘Doxygen’

```
git branch --delete doxygen
git branch -d doxygen
```

## Q2.5 The [ ] operator is known as ___

Answer: Subscript operator

```
a = [1,2]
a[0]
```

```
1
```

## Q3

For the following Python code, write the output of the print statement with values of variables as displayed

```
Super_string = 'Super-String'
chars = len(Super_string)
start = Super_string.count('-')
end = chars//2
s1 = Super_string[start:end]
s2 = s1 + 'son'
print(chars,start,end,s1,s2)
```

```
12 1 6 uper- uper-son
```

## Q4

## Q4.1 Python’s dill module can be used to ___

Answer: The most common use of dill module is to make pickle of (save) Python workspace objects for later usage

```
#pip install dill
import dill as dl # Calling the module
var1 = 11.55
var2 = 3.45
var3 = var1 + var2 # Creates the variable var3
dl.dump_session('three_vars.pkl') # Saves all three variables
print(var3)

del var1, var2, var3 # Deleting all the variables from Python session
# print(var3) # 'Variable is no more'
dl.load(open('three_vars.pkl','rb')) # Load the Pickle for consumption
print(var3) # Now var3 is ready to serve
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
<ipython-input-14-05295b498a57> in <cell line: 1>()
----> 1 import dill as dl # Calling the module
      2 var1 = 11.55
      3 var2 = 3.45
      4 var3 = var1 + var2 # Creates the variable var3
      5 dl.dump_session('three_vars.pkl') # Saves all three variables

ModuleNotFoundError: No module named 'dill'

---------------------------------------------------------------------------
NOTE: If your import is failing due to a missing package, you can
manually install dependencies using either !pip or !apt.
```

## Q4.2 from Decimal import decimal

Briefly explain (use) the above Python statement (One/Two liner explanation)

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```python
from Decimal import decimal
""" The above statement tries to load decimal function defition
from the Decimal Module """
# Since there is no module with 'Decimal' name, it generates an error
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
<ipython-input-13-5fa03b82e8a0> in <cell line: 1>()
----> 1 from Decimal import decimal
      2 """ The above statement tries to load decimal function defition
      3 from the Decimal Module """
      4 # Since there is no module with 'Decimal' name, it generates an error

ModuleNotFoundError: No module named 'Decimal'

---------------------------------------------------------------------------
NOTE: If your import is failing due to a missing package, you can
manually install dependencies using either !pip or !apt.

To view examples of installing some common dependencies, click the
"Open Examples" button below.
---------------------------------------------------------------------------
```

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## Q4.3 The execution of following Python code result into ( Choose between Option A or B )

- A. Will sort the elements in the reverse order
- B. Will generate an error as the code tries to mutate/change the elements

```python
tapal1 = ([1,2,3])
tapal1[0] = 3
tapal1[2] = 1
print(tapal1)
# This sorts the List in reverse order
```

```
[3, 2, 1]
```

## Q5

## Q5.1 Write the output of following Python code

```python
a = 3
b = 2.9
a = str(a)
b = int(b)
print(a*b)
```

```
33
```

## Q5.2 Write the output of following Python code

```
var1 = {"0:Zero", "1:One"}
var1.add("0:Zero")
var1.add("2:Two")
items = len(var1)
for counter in range(items):
    print(counter, end='-')
```

```
0-1-2-
```

## Q6

### Q6.1 How many cells get hidden after collapsing the ‘Defining functions’ cell? Briefly explain. [1]

Hint: ‘Defining functions’ is heading1. ‘Function documentation’ and ‘Calling a function’ are heading2 Answer: 5

### Heading 3

[ ] ↳ *5 cells hidden*

### Q6.2 Docstrings can be enclosed with three single quote characters in the beginning and end

( True/False ) [1]

```
#True
'''This is a docstring'''
"""This is also a docstring"""
```

```
'This is also a docstring'
```

### Q6.3 The definition of square function is also an example of default arguments ( True/False ) [1]

```
# False; There is no default value
```

### Q6.4 The indentation used in the definition of square functions has to be always an even value of whitespaces (True/False) [1]

```
#False
```

### Q6.5 A call to square function, as given below would yield

square(2,3,4)

```
def square(number): # Computes the square of a number
  """ For a number such as 2 it shall return 4"""
  return number ** 3
square(2)

square(2,3,4)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-19-cd619e10eea9> in <cell line: 6>()
      4 square(2)
      5
----> 6 square(2,3,4)

TypeError: square() takes 1 positional argument but 3 were given
```

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```
flag = 4
flag = 0 if flag = 0 else 1
print(flag)
```

```
  File "<ipython-input-20-eb768b0179fe>", line 2
    flag = 0 if flag = 0 else 1
           ^
SyntaxError: expected 'else' after 'if' expression
```

SEARCH STACK OVERFLOW

## Q6.6 Match the following [5]

```
A-c
B-e
C-b
D-a
E-d
```

## Q7

Briefly explain following Python concepts with concise executable Python code as an example

## Q7.1 Short circuit evaluation

```python
a = 1
if (a==2 or a == 3 or a == 5):
  print("All numbers are odd")
```

```
All numbers are odd
```

## Q7.2 Dictionary comprehension

```python
months = {'January': 1, 'February': 2, 'March': 3}
months2 = {number: name for name, number in months.items()} # Swapping
months2
```

```
{1: 'January', 2: 'February', 3: 'March'}
```

## Q7.3 Lambda function

```python
numbers = [1,2,3]
list(map(lambda x: x ** 2, numbers))
# The function has got no name
```

## Q7.4 Recursion

```python
def fib(n):
    if (n == 2 or n == 1):
        return(1)
    else:
        return(fib(n-1)+fib(n-2))


fib(2) # Fib function is defined recursively
# It calls itself again and again until termination
```

## Q7.5 Mutability

```python
var = ('PFA', 'DMW')
var[1] = 'DSA'
```

```
# Mutability allows user to change the items inside the data structures
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-22-76d63c8c9c70> in <cell line: 2>()
      1 var = ('PFA', 'DMW')
----> 2 var[1] = 'DSA'

TypeError: 'tuple' object does not support item assignment
```

SEARCH STACK OVERFLOW

## Q8

Match the following

```
A-2
B-1
C-5
D-3
E-4
```

## Q9

### Q9.1 Write the output for following Python code

```python
Pixels = ['Red', 'Green', 'Blue','Green']
Pixels = set(enumerate(Pixels))
elements = len(Pixels)
print(elements, Pixels)
```

```
4 {(0, 'Red'), (3, 'Green'), (2, 'Blue'), (1, 'Green')}
{(0, 'Red'), (3, 'Green'), (2, 'Blue'), (1, 'Green')}
```

### Q9.2 Write the formatted output for given below Python code snippet as per the f-string conventions for left alignment of tabular data

```python
numbers = [1,10,100,1000,10000]
for number in numbers:
  print(f'{number:<5}{number}')
```

```
1    1
10   10
100  100
1000 1000
1000010000
```