Q1: What will be the output produced by each of following function calls:

Program:

```
import math
print ("a:", math.ceil (65.65))
print ("b:", math.ceil (65.47))
print ("c:", math.fabs(-67.58))
print ("d:", math.fabs (3))
print ("e:", math.exp (2.7))
print ("f:", math.log(45,2))
print ("g:", math.log10 (1000))
print ("h:", math.pow (4, 1/2))
print ("i:", math.sqrt(121))
print ("j:", math.radians (30))
print ("k:", math.degrees (math.pi/2))
```

Output:

```
a: 66
b: 66
c: 67.58
d: 3.0
e: 14.879731724872837
f: 5.491853096329675
g: 3.0
h: 2.0
i: 11.0
j: 0.5235987755982988
k: 90.0
```

Q2: Give the range in which value of variable x may lie on execution of the following statements:

Program:

```
import random
x = random.random()+5
print
```

Output Range:

$5.0 \leq x < 6.0$

Q3: Evaluate the following expressions using python shell: Assume ASCII coding scheme is used for character data:

Program:
```
print(abs(-5.4))
print(abs(15))
print(chr(72))
print(round(-24.9))
print(float(57))
print(complex('1+2j'))
print(divmod(5,2))
print(pow(9,2))
print(max(97,88,60))
print(min(52,29,99))
print(max('a','b','AB'))
```

output:
```
5.4
15
H
-25
57.0
(1+2j)
(2,1)
81
97
29
b
```

Q4: Consider the following function and find the outputs:

Program:
```
def nMultiple(a=0, num=1):
    return a*num
print(nMultiple(5))
print(nMultiple(5,6))
print(nMultiple(num=7))
print(nMultiple(num=6, a=5))
print(nMultiple(5, num=6))
```

output:
```
5
30
0
30
30
```

Q5: Study the following program segment and give the output.

Program:

```
def fun():
    pass

a = fun()
print(a)
```

output:

None.

Q6: (a) Study the following program segment and give the output.

Program:

```
def say(message, times=2):
    print(message* times)

say('Hello')
say('World', 5)
```

output:

HelloHello
WorldWorldWorldWorldWorld.

(b) Study the following program segment and give the output:

Program:

```
def fun(a=2, b=3, c=7):
    d= a+b+c
    print (d)
print(fun(2))
```

output:

12
None.

Q7: Define a function to find the sum of even digits of a four digit number without using control structures:

Program:
```
def sumEvenDigits(num):
    d1=num//1000
    d2=(num//100)%10
    d3=(num//10)%10
    d4=num%10
    total=((d1*(1-d1%2))+(d2*(1-d2%2))+(d3*
    (1-d3%2))+(d4*(1-d4%2)))
    return total

number=int(input("Enter a four-digit number:"))
print("Sum of even digits:", sumEvenDigits(number))
```

output:
```
Enter a four-digit number: 1234
Sum of even digits: 6
```

Q8: Using a function, evaluate the value of an arithmetic expression taken from the user.

Program:
```
def evaluate(exp):
    return eval(exp)

expression=input("Enter an arithmetic expression:")
print("Result:", evaluate(expression))
```

output:
```
Enter an arithmetic expression: 2*3
Result: 6
```

Q9: What does a function return by default in python?

Program:
```
def noReturn():
    print("This function has no return value")

a=noReturn()
print(a)
```

output:
```
This function has no return value
None
```

Q10: Write a function named 'Uppercase' which converts a lowercase alphabet to uppercase.

Program:
```
def Ucase(ch):
    assert 'a' <= ch <= 'z', "Not a lowercase"
    return chr(ord(ch) - 32)

ch = input("Enter a lowercase alphabet: ")
print("Uppercase:", Ucase(ch))
```

Output:

Enter a lowercase alphabet: v
Uppercase: V

Q11: Write a python function to swap the variables values of two variables.

Program:
```
def swap(a,b):
    a,b = b,a
    return a,b

x,y = 5, 11
print("Before swap:", x, y)
x,y = swap(x,y)
print("After swap:", x,y)
```

output:

Before swap: 5 11
After swap: 11 5

Q12: Write a function areaTriangle to find the area of a triangle.

Program:
```
import math
def areaTriangle(a, b, c):
    assert (a+b>c and a+c>b and b+c>a), "Invalid triangle sides"

    s=(a+b+c)/2
    area = math.sqrt(s*(s-a)*(s-b)*(s-c))
    return area
print("Area:", areaTriangle(3,4,5))
```

output: Area: 6.0

Q13: Write a python function to calculate factorial of prime.

Program:
```
def factorial(n):
    fact=1
    for i in range(1, n+1):
        fact *= i
    return fact
num = int(input("Enter a number:"))
print("Factorial:", factorial(num))
```

output:
```
Enter a number: 7
factorial: 5040
```

Q14: Write a function to check whether a number falls with in a given range.

Program:
```
def checkRange(num, start, end):
    if num in range(start, end+1):
        print("Number is within the range")
    else:
        print("Number is outside the range")

checkRange(8,5,10)
```

output:
```
Number is within the range
```

Q15: Observe carefully the function and find outputs.

Program:
```
def fun(a=0, b=1):
    return(a**2+b**2)
print(fun(2, a=3))
print(fun(b=3, 2))
print(fun(3, b=2))
print(fun(a=4,5))
```

output:
```
Error
Error
13
Error
```

Q16: What will be the output of the following code?

Program:

```
x = -5
def display(x):
    print(x)
    x = 5
    print(x)

display(x)
print(x)
```

output:

```
-5
5
-5
```

Q17: Create the following scripts and justify the output.

program: importedModule.py

```
def test1():
    print("test1 in imported module")
def test2():
    print("test2 in imported module")

test1()
test2()
```

mainModule.py

```
import importedModule
print('hello')
```

output:

```
test1 in imported module
test2 in imported module
hello
```

Q18: Create the following scripts f1 and f2, execute f2 and justify output.

Program: f1.py

```
def display()
    print('hello')

display()
print("ITER")
```

f2.py

```
import f1
f1.display()
```

output:

```
hello
ITER
hello
```

Q19: Create the following scripts f1 and f2, execute f2 and justify output.

Program: f1.py

```
def display():
    print("hello')

if __name__=="__main__":
    display()
    print('ITER')
```

f2.py

```
import f1
f1.display
```

output:

```
hello
```