

Q.1. What will be the output of the following code in Python? Briefly explain your answers. ( $4*1=4$ )

```
(a) i=20
for i in range(5):
    print(i)
    i = i+1
    print(i)

(b) lst = [0]
for i in lst:
    print(i)
    lst.append(i+1)
```

Output:

0  
1  
1  
2  
2  
3  
3  
4  
4  
5

Output:

Infinite loop

```
(c) lst = [20,31,42]
    lst[1:2] =[3,4,5,6]
    print(lst)

(d) a,b = 30, 50
    while b:
        a,b = b, a%b
    print (a)

Output:
# [20, 3, 4, 5, 6, 42]
# output: 10
```

Q.2 Evaluate the following expressions and show all intermediate steps: ( $3*1=3$ )

(a)  $9*5\&6|4**3+7$

$9*5\&6|64+7$   
 $45\&6|64+7$   
 $45\&6|71$   
 $4|71$   
 $71$

(b)  $2**3//3\%2+(6-3)/2$

$2**3//3\%2+3/2$   
 $8//3\%2+3/2$   
 $2\%2+3/2$   
 $0+3/2$   
 $0+1.5$   
 $1.5$

(c)  $8^4\<<3\%2$

$8^4\<<1$   
 $8^8$   
 $0$

Q.3. Attempt any two of the following: ( $4*2=8$ )

- (a) Define a function in Python to check whether a given number is perfect or not. A perfect number is a positive integer that is equal to the sum of its proper

positive divisors, i.e. the sum of its positive divisors excluding the number itself. e.g. 6 is a perfect number because 1, 2 and 3 are its positive divisors and  $1+2+3=6$ .

```
def perfect_number(n):
    sum = 0
    for x in range(1, n):
        if n % x == 0:
            sum += x
    return sum == n
print(perfect_number(6))
```

- (b) Write a program in Python that inputs a list from user and print a new list with unique elements of the input list. For example, for list [1,2,2,3,1,3,3] the output should be [1,2,3].

```
n=int(input('Enter elements in list' ))
l=[]
for i in range(n):
    i = int(input('Enter number: '))
    l.append(i)
x = []
for a in l:
    if a not in x:
        x.append(a)
print(x)
```

- (c) The least common multiple (LCM) of two integer numbers is the smallest positive integer that is perfectly divisible by the two given numbers. For example, the LCM of 10 and 4 is 20 and LCM of 3 and 5 is 15. Write a program in Python to find the LCM of two numbers.

```
def lcm(x, y):
    if x > y:
        greater = x
    else:
        greater = y

    while(True):
        if((greater % x == 0) and (greater % y == 0)):
            lcm = greater
            break
        greater += 1

    return lcm
```

```
# take input from the user
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))

print("The L.C.M. of", num1,"and", num2,"is",
lcm(num1, num2))
```