

RECURSION

ASSIGNMENTS

Q.1 What is recursion?

Q.2 What are the advantages of recursion?

Q.3 What are the disadvantages of recursion?

Q.4 Define a recursive function to find out HCF of two numbers.

Q.5 Trace the program given below, if we pass 5 in nterms.

```
def fib(n):
if n <= 1:
    return n
else:
    return(fib(n-1) + fib(n-2))
nterms = int(input("enter a number"))
if nterms <= 0:
    print("Please enter a positive integer")
else:
    print("Fibonacci sequence:")
for i in range(nterms):
    print(fib(i))
```

Q.6 Write a program in python which prompt 10 numbers for a list, arrange these numbers in ascending order. Define a recursive function binsearch to search the position of a number in the list.

Q.7 What is the output of the following piece of code?

```
def test(i,j):  
    if(i==0):  
        return j  
    else:  
        return test(i-1,i+j)  
print(test(4,7))
```

Q.8 Write a recursive Python function that returns the sum of the first n integers.

(Hint: The function will be similar to the factorial function!)

Q.9 Differentiate iteration and recursion.

Q.10 what is a base case in recursion

Q.11 Fill in the line of code for calculating the factorial of a number.

```
def fact(num):  
    if num == 0:  
        return 1  
    else:  
        return _____
```

Q.12 After filling in the line of above program,trace it ,if we pass num as 5.

Q.13 what happens if the base condition isn't defined in recursive programs?

Q.14 What happens if recursive function reaches its depth of 1000 calls?

Q.15 What is the output of the following piece of code?

```
def a(n):
    if n == 0:
        return 0
    elif n == 1:
        return 1
    else:
        return a(n-1)+a(n-2)
for i in range(0,4):
    print(a(i),end=" ")
```

Q.16 Print multiplication table of 12 using recursion.

Q.17 Write a function to calculate power of a number raised to other (a^b) using recursion.

Q.18 Write a recursive function to reverse a list elements.

Q.19 What are the practical applications of recursion.

Q.20 Write a function that takes in two numbers and recursively multiplies them together.

Q.21 Write a function using recursion to print numbers from n to 0

Q.22 Can we increase the maximum depth of function call, how, write source code.

Q.23 Differentiate tailrecursion and nontailrecursion.