

(Q1) Write a Python program to calculate the area of a rectangle given its length and width?

```
l = int(input('Enter Length of the Rectangle: ')) b
= int(input('Enter Breadth of the Rectangle: '))
print(f' Area of rectangle is: {(l*b)}')
```

(Q2) Write a program to convert miles to kilometers?

```
miles = int(input("Please enter miles:")) print(miles*1.6,
" Kms")
```

(Q3) Write a function to check if a given string is a palindrome?

```
def isPalindrome(str):
    if (str == str[::-1]):
        return "The string is a palindrome."
    else:
        return "The string is not a palindrome."
str = input ("Enter string: ")
print(isPalindrome(str))
```

(Q4) Write a Python program to find the second largest element in a list?

```
i = input("Enter elements of the list separated by spaces: ")
li= list(map(int, i.split())) sort = sorted(set(li)) if len(sort)
>= 2:    print("Second largest element is:", sort[-2]) else:
print("No second largest element found.")
```

(Q5) Explain what indentation means in Python?

1. Indentation can be achieved by four spaces or tab space in workspace
2. It helps Python determine the structure of the code

Effects:

□ Incorrect indentation can lead to

1. syntax errors
2. change the logical structure of the code
3. potentially leading to unintended behaviour.

Example:

```
If(age>=18):
```

```
    Print("Eligible to vote")
```

```
else:
```

```
    Print("Not Eligible to vote")
```

(The print statement outside the if block is not indented, indicating that it is not part of the if block.)

(Q6) Write a program to perform set difference operation?

```
def user_input():    i= input("Enter elements of the set separated  
by spaces: ")    return set(map(int, i.split())) set1 = user_input()  
set2 = user_input() print("Union:", set1 | set2 )  
print("Intersection:", set1 & set2) print("Difference:", set1 -  
set2) print("Symmetric Difference:", set1 ^ set2) print("Is  
Subset:", set1 <= set2) print("Is Superset:", set1 >= set2)  
print("Are Disjoint:", set1.isdisjoint(set2))
```

(Q7) Write a Python program to print numbers from 1 to 10 using a while loop?

```
n= 1 while n <= 10:
```

```
    print(n)
```

```
    n+=1 (Q8)
```

Write a

program to

calculate the

factorial of a

number using

a while loop?

```
i = int(input("Enter a non-negative integer: ")) if i < 0:
print("Factorial is not defined for negative numbers.")
elif i == 0 or i == 1:    print("The factorial of", i, "is: 1")
else    result = 1    n = i
    while n > 1:        result *= n        n -= 1
print(f"The factorial of {i} is: {result}")
```

(Q9) Write a Python program to check if a number is positive, negative, or zero using ifelif-else statements? n = int(input("Enter a number: ")) if n> 0:

```
    print("The number is positive.")
elif n < 0:    print("The number is
negative.") else:    print("The
number is zero.")
```

(Q10) Write a program to determine the largest among three numbers using conditional

Statements? n1 = int(input("Enter the first
number: ")) n2 = int(input("Enter the second
number: ")) n3 = int(input("Enter the third
number: ")) l = n1 if n2 > l: l = num2
if n3 > l: l = num3
print("Largest number is:", l)

(Q11) Write a Python program to create a numpy array filled with ones of given shape?

```
import numpy as np print(np.ones(int(input(" "))))
```

(or)

```
import numpy as np i = input("Enter the shape of the array  
separated by spaces : ") print(np.ones(tuple(map(int,  
i.split()))))
```

#i- input by user is "3 4".

#split()- returns a list of substrings. it returns ["3", "4"].

#map()-converts each string in the list to an integer. It becomes [3, 4].

#tuple()-converts the map object returned by map() into a tuple.(3,4).

(Q12) Write a program to create a 2D numpy array initialized with random integers?

```
import numpy as np rows = int(input("Enter the number of rows: ")) cols =  
int(input("Enter the number of columns: ")) start = int(input("Enter the begin value of  
range: ")) stop = int(input("Enter the last value of range: "))  
print(np.random.randint(strat,stop,(rows, cols)))
```

(Q13) Write a Python program to generate an array of evenly spaced numbers over a specified range using linspace?

Syntax: np.linspace(start,end,number of elements)-evenly spaced step size import
numpy as np
start = int(input("Enter the start of the range: "))
end = int(input("Enter the end of the range: "))
num= int(input("Enter the number of points: "))
print(np.linspace(start, end, num))

(Q14) Write a program to generate an array of 10 equally spaced values between 1 and 100 using Linspace? import numpy as np print(np.linspace(1, 100, 10))

(Q15) Write a Python program to create an array containing even numbers from 2 to 20 using Arange?

Syntax: np.arange(stat,end,stepsize)-number of elements will depend on stepsize and end value

Note: end value should be exceed up on one by our required value

```
import numpy as np print(np.arange(2, 21, 2))
```

(Q16) Write a program to create an array containing numbers from 1 to 10 with a step size of 0.5? using arange.

```
import numpy as np print(np.arange(1,  
11, 0.5))
```