WORKSHEET – Numpy

1	What will be the output of following code- **import numpy as np** **A=np.array([24,46,57,14,68,34,89,92])** **print(A[7:3:-1])** **print(A[2:6])** Ans: [92 89 34 68] [57 14 68 34]
2	What will be the output of following code- **import numpy as np** **A=np.array([1,2,3,4,5,6,7,8,9,10,11,12])** **print(A[10:5:-2])** **Ans:** [11 9 7]
3	What will be the output of following code- **import numpy as np** **A=np.ones(6)** **print(A)** **B=np.reshape(A,(2,3))** **print(B)** **Ans:** [1. 1. 1. 1. 1. 1.] [[1. 1. 1.] [1. 1. 1.]]
4	What will be the output of following code- **import numpy as np** **arr= np.array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])** **print(arr[::-2])** Ans: [9 7 5 3 1]
5	What will be the output of following code- **import numpy as np** **arr= np.array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])** **print(arr[-2::-2])**

	Ans: [8 6 4 2 0]
6	**What will be the output of following program:** **import numpy as np** **A=np.array([24,46,57,14,68,34,89,92])** **print(A[-6:len(A)-1])** Ans: [57 14 68 34 89]
7	**What will be the output of following program:** **import numpy as np** **A=np.array([24,46,57,14,68,34,89,92])** **B=np.array([24,78,66,14,68,34,70,92])** **c=np.where(A==B)** **print(c)** Ans: (array([0, 3, 4, 5, 7], dtype=int32),)
8	**Point out the Correct Statement:** **1. We can not change the size of NumPy array.** **2. NumPy array can contain elements of non-homogenous type.** **3. Python List occupy less space than a NumPy array.** **4. All of the Above.** **Ans:** 1. We can not change the size of NumPy array.
9	**WAP to swap first two columns in a 2D numpy array?** Ans: import numpy as np arr = np.arange(9).reshape(3,3) print(arr) print(arr[:, [1,0,2]]) **Or** import numpy as np arr = np.arange(9).reshape(3,3) print(arr) arr[:, [0,1]]=arr[:,[1,0]] print(arr)

10	**WAP to swap first two rows in a 2D numpy array?** Ans: import numpy as np arr = np.arange(9).reshape(3,3) print(arr) print(arr[[1,0,2], :]) **OR** import numpy as np A = np.arange(9).reshape(3,3) A[[0,1]] = A[[1,0]] print(A)
11	**WAP to reverse the rows in a 2D numpy array?** Ans: import numpy as np arr = np.arange(9).reshape(3,3) print(arr) print(`arr[::-1]`)
12	**WAP to reverse the columns in a 2D numpy array?** Ans: import numpy as np arr = np.arange(9).reshape(3,3) print(arr) print(`arr[:, ::-1]`)
13	**WAP in Given a 1D array to negate all elements which are between 3 and 8.** **Ans:** import numpy as np A = np.arange(11) A[(A>=3) & (A<=8)] *= -1 print(A)

14 **WAP to subtract the mean from each row of a 5*5 array.**

Ans:

```
import numpy as np
X = np.arange(25).reshape(5,5)
print(X)
print(X.mean(axis=1))
Y = X - X.mean(axis=1)
print(Y)
```

15 **WAP in a given numpy array to return array of odd rows and even columns**

sampleArray = numpy.array([[3 ,6, 9, 12], [15 ,18, 21, 24],
[27 ,30, 33, 36], [39 ,42, 45, 48], [51 ,54, 57, 60]])

Expected Output:

Printing Input Array

```
[[ 3  6  9 12]
 [15 18 21 24]
 [27 30 33 36]
 [39 42 45 48]
 [51 54 57 60]]

 Printing array of odd rows and even columns
[[ 6 12]
 [30 36]
 [54 60]]
```

Ans :

```
import numpy
sampleArray = numpy.array([[3 ,6, 9, 12], [15 ,18, 21, 24],
[27 ,30, 33, 36], [39 ,42, 45, 48], [51 ,54, 57, 60]])
print("Printing Input Array")
print(sampleArray)

print("\n Printing array of odd rows and even columns")
```

	newArray = sampleArray[::2, 1::2] print(newArray)
16	**WAP to Create a 5X2 integer array from a range between 100 to 200 such that the difference between each element is 10** **Ans :** import numpy print("Creating 5X2 array using numpy.arange") A= numpy.arange(100, 200, 10) print(A.reshape(5,2))
17	**WAP to Create a 4X2 integer array and Prints its attributes** **The element must be a type of unsigned int16. And print the following Attributes: –** **The shape of an array.** **Array dimensions.** **The Length of each element of the array in bytes.** **Ans:** import numpy as np A=np.zeros([4,2], dtype =int) print("Printing Array") print(A) print("Printing numpy array Attributes") print("1> Array Shape is: ", A.shape) print("2>. Array dimensions are ", A.ndim) print("3>. Length of each element of array in bytes is ", A.itemsize)
18	**WAP to create a 3*3 numpy array with all the elements as per the user choice and print the sum of all elements of the array.** **Ans:** import numpy as np a=np.zeros(9,dtype=int).reshape(3,3) sum=0 for i in range(3):

	for j in range(3): num=int(input('enter element of array')) a[i][j]=num sum=sum+a[i][j] print(a) print('summ of All elements of array is:',sum)
19	**Which of the following is a data type of elements of NumPy array created by the linespace() method?** **1. float64 2. int32 3. bool 4.int16** **Ans:** 1
20	**Which of the following is used to create one dimensional array from string?** **1. formstring() 2. Fromstr() 3. fromstring() 4.fromstr()** **Ans:** 3
21	**What is the use of reshape() method?** 1. To create 2D array from 1D array 2. To create 1D array from 2D array 3. Both 1 and 2 4. None of the above Ans: 1
22	**What is the output of the following program?** import numpy as np A=np.array([[3,2,4],[3,4,5]]) print(A.T.shape) **1. (2,3)** **2. (3,3)** **3. (3,2)** **4. None** Ans: (3,2)
23	**What will be the output of the program?** **import numpy as np** **a=np.array([2,3,4,5])** **b=np.array([6,7,8,9])** **c=a+b** **print(c)** **Ans:** [8,10,12,14]

24	**Which of the following is not the method of linear regression?** **1. Best Fit Line Method** **2. polyfit() method** **3. plot() method** **4. None** Ans: 3
25	**What does positive covariance means?** **1.** Similar **2.** Same **3.** Strongly similar **4.** None Ans: 3
26	**Slicing is specified by using _____ operator.** Ans: colon
27	**Transpose of a 2D array can be done by using _____.** Ans: .T or transpose()
28	**NumPy array supports _____ operations which is not supported in Python List.** Ans: vectorized
29	**An array consist of _____ and _____.** Ans: Element and index
30	**NumPy is an _____ module of Python.** Ans: **open-source**
31	**Write a program to convert a string into an array.** Ans: import numpy as np A=np.fromstring('1 2 3 4', dtype=int, sep=' ') print(A)
32	**Write a program in numpy to count the number of even and odd element in 1D array.** **Ans:** import numpy as np

```
a=np.arange(1,20)
counteven=0
countodd=0
print(a)
for i in range(len(a)):
    if(a[i]%2==0):
        counteven=counteven+1
    else:
        countodd=countodd+1
print('No of even elements are::::',counteven)
print('No of Odd elements are::::',countodd)
```

33 **Write a Program to store 30 zeros in an array.**
Ans:

```
import numpy as np
a=np.zeros(30)
print(a)
```

34 **WAP to compute the covariance of two arrays.**

Ans:

```
import numpy as np
a=np.array([11,22,33,44,55])
b=np.array([66,77,88,99,110])
print(np.cov(a,b))
```

35 **Write a program to check whether none of the elements of a given array is zero.**

Ans:

```
import numpy as np
a=np.arange(0,20)
print(a)
if np.all(a):
    print('Array does'nt contain Zeros')
else:
    print('Array contains Zeros')
```

36 **Write a program in NumPy to create two array and store 5 ones in first and 5 tens in second array and store the sum of both the array in third array.**

Ans:

```
import numpy as np
First=np.ones(5,dtype=int)
Second=np.full(5,10,dtype=int)
Third=First+Second
print(First)
print(Second)
print(Third)
```

37 **Write a program in NumPy to create 9*9 array in which the elements in the alternate row(i.e. odd rows) will be equal to 1s and others as 0s.**

Ans:

```
import numpy as np
A=np.full((9,9),1,dtype=int)
for i in range(len(A)):
    if i%2==0:
        A[i]=0
print(A)
```

38 **Write a NumPy program to create 3*3 array in which elements entered by the user:**

Input:

36	4	6
7	8	9
16	3	5

Output:

36	4	0
0	8	0
16	0	0

Ans:

```
import numpy as np
a1=np.array([[36,4,6],[7,8,9],[16,3,5]])
r,c=a1.shape
t=np.empty((3,3),dtype=int)
for i in range(r):
    for j in range(c):
        if a1[i][j]%4==0:
            t[i][j]=a1[i][j]
```

```
        else:
            t[i][j]=0
print(a1)
print('Array after transsformation')
print(t)
```

39 What will be the output of following program:

```
import numpy as np
a1=np.array([[14,36],[17,47]])
a2=np.array([[10,15]])
a3=np.concatenate((a1,a2),axis=0)
print(a3)
a4=a3.reshape(2,3)
print()
print(a4)
```

Ans:

```
[[14 36]
 [17 47]
 [10 15]]

[[14 36 17]
 [47 10 15]]
```

40 **Write a NumPy program to create a 3*3 identity matrix i.e. , diagonal of elements are 1 and the rest are 0. Replace all 0s with any random number from 5 to 20.**

Ans:

```
import numpy as np
import random
a=np.zeros(9,dtype=int).reshape(3,3)
for i in range(3):
    for j in range(3):
        if i==j:
            a[i][j]=1
        else:
            a[i][j]=random.randint(5,21)
print(a)
```

41	**WAP in NumPy to Create a null vector of size 10 but the fifth value which is 1.** **Ans:** import numpy as np a = np.zeros(10) a[4] = 1 print(a)
42	**WAP in NumPy to Create a 3x3 identity matrix.** **Ans:** import numpy as np a=np.eye(3) print(a)
43	**What will be the output of following program?** **import numpy as np** **x=np.array([[1,2],[3,4]])** **y=np.array([[12,30]])** **z=np.concatenate((x,y.T), axis=1)** **print(z)** **Ans:** [[1 2 12] [3 4 30]]
44	**What will be the output of following program?** **import numpy as np** **x=np.array([[1,2],[3,4]])** **y=np.array([[12,30]])** **z=np.concatenate((x,y), axis=None)** **print(z)** **Ans:** [1 2 3 4 12 30]