LAB 6

Q1:

```
import numpy as np

Array = np.ones((4,4))

file = open("test.txt", "w+")

content = str(Array)

file.write(content)

file.close()

file = open("test.txt", "r")

content = file.read()

print(content)

file.close()
```

```
[[1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]]
```

Q2:

```
from scipy.special import cbrt

my_cb = cbrt([27, 64,891])

print("The cube roots are :")

print(my_cb)
```

```
The cube roots are :
[3.         4.         9.62260299]
```

Q3:

```
from scipy import linalg

arr1=np.array([[4,5],[3,2]])

linalg.det(arr1)
```

```
Out[10]: -7.0
```

```
linalg.inv(arr1)
```

```
Out[11]: array([[-0.28571429,  0.71428571],
                [ 0.42857143, -0.57142857]])
```

Q4:

```
import scipy.linalg as la

arr=np.array([[5,4],[6,3]])

results = la.eig(arr)

print("Eigen Values: ",results[0])

print("Eigen Vector: ",results[1])
```

```
Eigen Values:  [ 9.+0.j -1.+0.j]
Eigen Vector:  [[ 0.70710678 -0.5547002 ]
 [ 0.70710678  0.83205029]]
```

Q5:

```
4]: from scipy import sparse
    A = sparse.csr_matrix(np.array([[0, 2], [5, 0]]))
    B = sparse.csr_matrix(np.array([[1, 2], [3, 4]]))
    sparse.kron(A, B).toarray()
```

```
4]: array([[ 0,  0,  2,  4],
           [ 0,  0,  6,  8],
           [ 5, 10,  0,  0],
           [15, 20,  0,  0]], dtype=int32)
```

```
5]: sparse.kronsum(A, B).toarray()
```

```
5]: array([[1, 2, 2, 0],
           [5, 1, 0, 2],
           [3, 0, 4, 2],
           [0, 3, 5, 4]], dtype=int32)
```