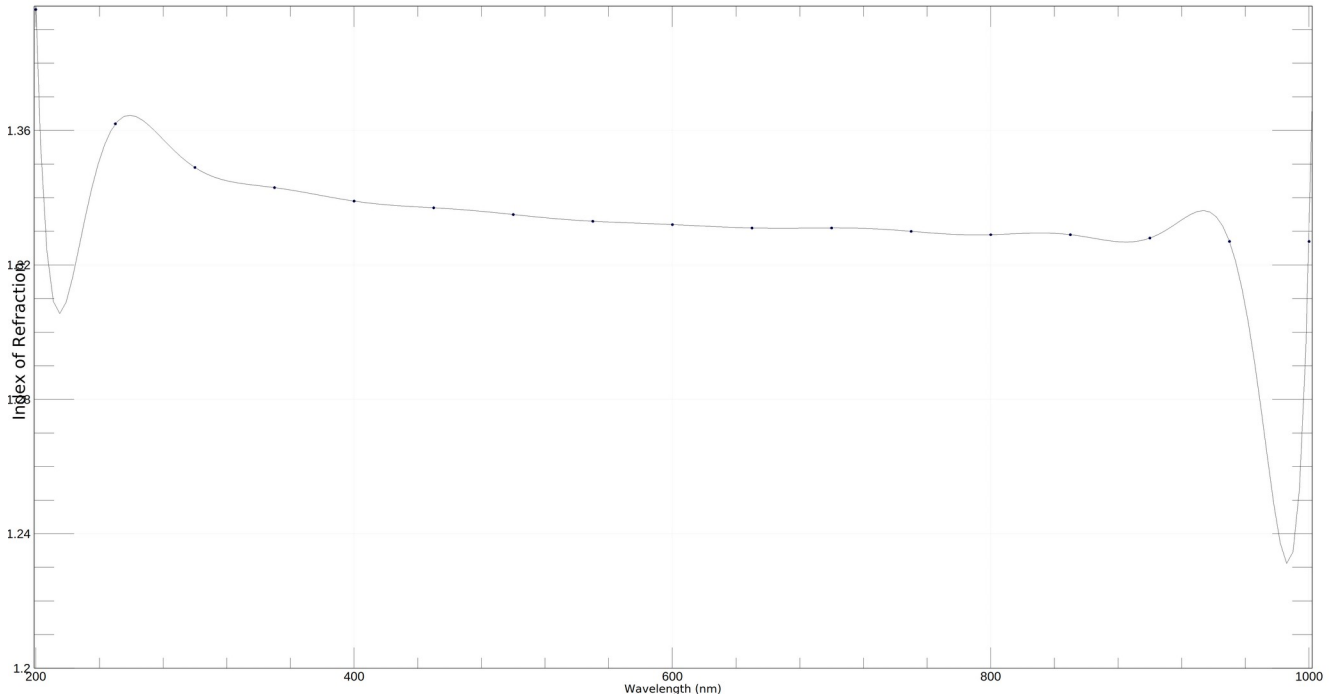
Assignment- 6

4.7- Graph is obtained as:



5.7-

Answer for (a):

```
 -3.4542e-18     0.707107  9.18861e-18  6.55509e-16  6.50521e-19
    0.707107  6.53232e-17            1  1.99493e-17  4.53023e-15
-4.68917e-18            1 -5.63785e-18      1.22474 -7.63278e-17
 6.83264e-16  -2.1684e-17      1.22474 -7.63278e-17      1.41421
 8.67362e-19  4.41834e-15 -7.63278e-17      1.41421 -3.19189e-16
```

Answer for (b):

```
         0.5  4.66207e-18     0.707107  8.23994e-18  3.18235e-15
 4.60786e-18          1.5 -5.20417e-18      1.22474 -4.16334e-17
    0.707107 -4.33681e-18          2.5  6.93889e-18      1.73205
 8.23994e-18      1.22474 -2.08167e-16          3.5 -5.82867e-16
 3.15459e-15 -4.16334e-17      1.73205 -5.27356e-16          4.5
```

Answer for (c):

```
-2.94903e-17  0.000638493  4.16334e-16    0.0114251  1.77636e-15
    -1.99934  6.10623e-16      -1.3926  5.10703e-15    -0.980644
 4.85723e-16     -5.63429  7.32747e-15     -6.54619  3.28626e-14
    -2.43647  6.21725e-15     -15.1869  4.79616e-14      -21.213
 2.83107e-15       -9.514  4.35207e-14     -39.4536  1.88294e-13
```

Answer for (d):

```
        0.25  4.63496e-18    -0.353553  2.14672e-17  3.96948e-15
 5.69206e-19         1.25  3.16587e-17    -0.612372 -2.25514e-17
    0.353553  2.51535e-17         2.25 -1.17961e-16    -0.866025
 4.11997e-18     0.612372 -5.20417e-17         3.25 -3.46945e-16
 1.57773e-15 -1.21431e-17     0.866025 -2.63678e-16         4.25
```

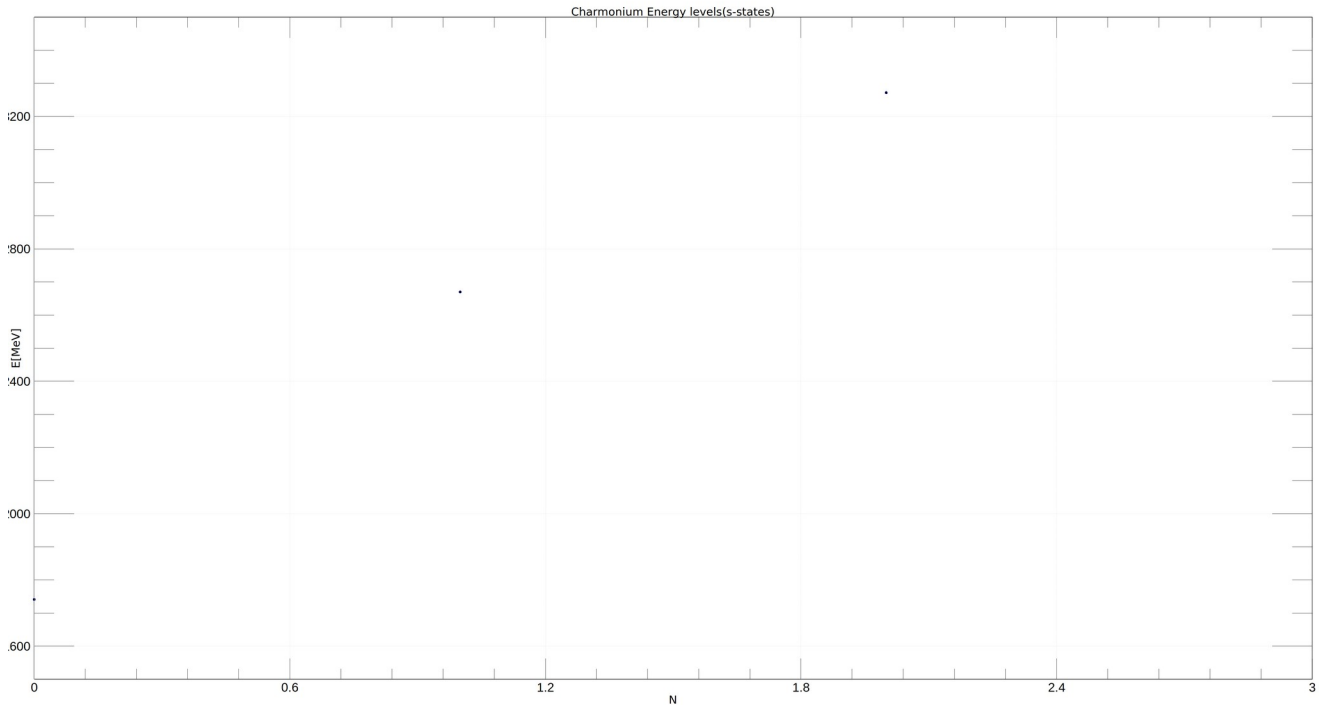
5.9-

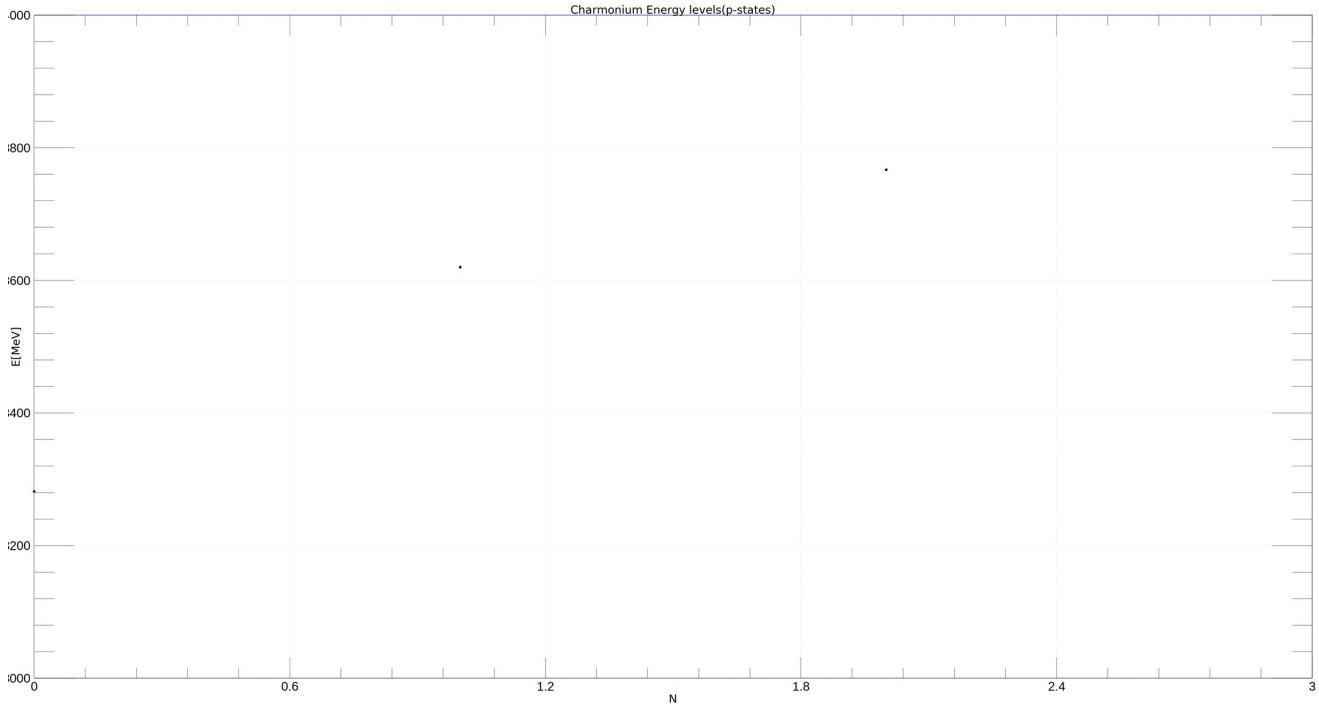
a) S-state solution (l=0)

State	**Energy (MeV)**
0	-999
1	-70
2	291

b) P-state solution (l=1)

State	**Energy (MeV)**
0	541.7
1	719
2	880


Charmonium Energy levels(s-states)
E[MeV]
N
0
0.6
1.2
1.8
2.4
3


Charmonium Energy levels(p-states)
E[MeV]
N
0
0.6
1.2
1.8
2.4
3