***Name : HIMANSHU DIXIT***

***Enrollment Number: B64178***

***Batch: B10***

***Experiment No : 3***

***(DIFFRACTION GRATING)***

***Aim:***

***1.*** *To calculate the wavelength of the other prominent lines of mercury by normal incidence method.*

***2.*** *To determine the number of lines per millimeter of the grating using the green line of the mercury spectrum.*

***Formula Used:***

|  |
| --- |
| ***Sin θ = NnX*** |

*Where ,*

*N is the number of lines per unit length of the grating.*

*n is the order of the spectrum.*

*X is the wavelength of light.*

*θ is the diffraction angle.*

***Obesevation table:***

***1.*** *To find the number of lines per unit length of the grating.*

* *Wavelength of green light is 541.6nm.*
* *Least count of scale is 1/60.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Green*  *X(nm)* | *Left* | | *Right* | | *Difference Reading*  *(2θ)* | | *Mean(θ)* | *N=sinθ/nX* |
| *Ver 1* | *Ver 2* | *Ver 1* | *Ver 2* | *Ver 1* | *Ver 2* |
| *546.1nm* | *340.134* | *160.100* | *19.034* | *199.00* | *321.1* | *38.9* | *90* | *1831166* |

***2.*** *Determination of wavelength for prominent lines.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Colours* | *Left* | | *Right* | | *Difference Reading*  *(2θ)* | | *Mean(θ)* | *X=sinθ****/****nN* |
| *Ver 1* | *Ver 2* | *Ver 1* | *Ver 2* | *Ver 1* | *Ver 2* |
| *Yellow1* | *339.567* | *159.534* | *20.067* | *200.017* | *315.5* | *40.483* | *88.99575* | *546.44nm* |
| *Yellow2* | *316.0* | *136.0* | *43.634* | *223.6* | *272.366* | *87.6* | *89.9915* | *273.22nm* |
| *Blue 1* | *342.634* | *162.6* | *17.067* | *197.017* | *325.567* | *34.417* | *89.996* | *547.45nm* |
| *Violet 1* | *344.634* | *164.6* | *15.017* | *195* | *329.617* | *30.4* | *90.00425* | *548.53nm* |
| *Violet 2* | *328.5* | *148.15* | *31.534* | *211.5* | *296.966* | *63.35* | *90.079* | *272.54nm* |

***Result:***

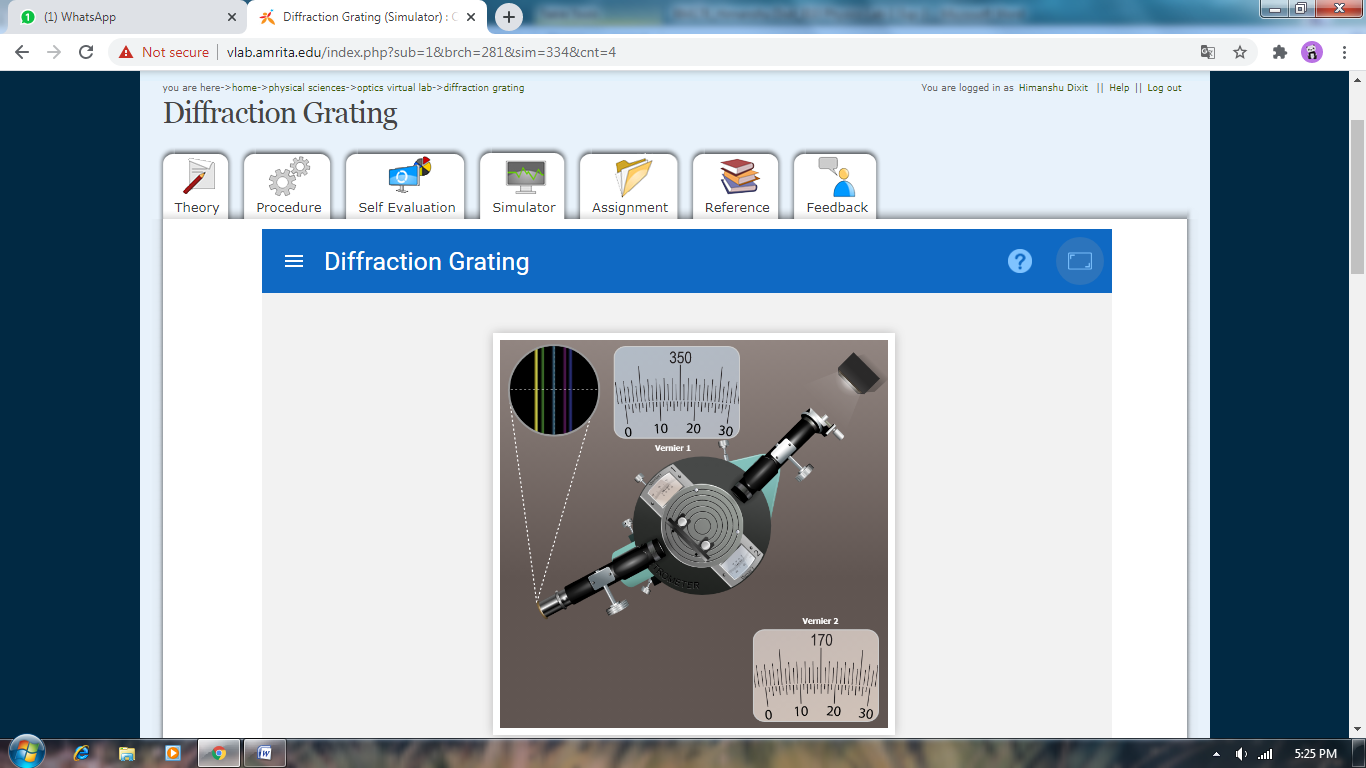
***1.*** *The wavelegth of Yellow I =  .........546.44..........nm.*

***2.*** *The wavelegth of Yellow II =  .........273.22..........nm.*

***3.*** *The wavelegth of Blue =  ........547.45.........nm.*

***4.*** *The wavelegth of Violet I =  ......548.53........nm.*

***5.*** *The wavelegth of Violet II =  .......272.54.......nm.*

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