This worksheet contains the odd numbered experiments.

All team members must complete experiment 1 together, this will introduce you to the basics of the equipment and experiment.

After that while some members are working on analysis for an experiment in this worksheet, the other members should work on an experiment in worksheet B.

Once all experiments are completed answer the questions on page 1 of worksheet B as a group.

This lab will be done over a period of two weeks, the individual experiments are:

|  |  |  |
| --- | --- | --- |
| # | Title | Points |
| 1 | Introduction to the Experiment | 3 |
| 2 | Reflection | 2 |
| 3 | Refraction Through a Prism | 2 |
| 4 | Polarization | 3 |
| 5 | Standing Waves | 2 |
| 6 | Double Slit interference | 3 |
| 7 | Michelson Interferometer | 2 |
| 8 | Fiber Optics | 1 |
| 9 | Lloyd’s Mirror | 2 |
| 10 | Fabry-Perot Cavity | 2 |
| 11 | Brewster’s Angle | 2 |
| Q | Final Questions | 2 |

Your lab instructor will determine which ones and how many you have to finish for your lab.

***Experiment 1:***

This experiment introduces you to the equipment, make sure everyone is watching for the very first part is you figure out the dials and settings.

Do steps A-D,F

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 1.1** | | | |
| R (cm) | Meter Reading, M (unitless) | M x R(cm) | M x R2 (cm2) |
| 40 |  |  |  |
| 60 |  |  |  |
| 70 |  |  |  |
| 80 |  |  |  |
| 90 |  |  |  |
| 100 |  |  |  |

**Q1.1)**

**Q1.2)**

Do steps F,G

**Q1.3)**

Do steps H, I

**Q1.4)**

Do step J

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 1.2** | | | | | |
| Angle on Goniometer | Meter  Reading | Angle on Goniometer | Meter  Reading | Angle on Goniometer | Meter  Reading |
| 90°  110°  130°  150°  160°  170°  175° |  | 180°  185°  190°  200°  210°  230°  250° |  | 270° |  |

**Q1.5)**

|  |  |
| --- | --- |
| **Table 3.1** | |
| **θ** |  |
| **θ2** |  |
| **θ1** |  |
| **n1/n2** |  |
| **n1** |  |

***Experiment 3:***

Perform steps A-D to fill in the table.

Do steps E and F. Show work below.

**Q3.2)**

**Q3.3)**

**Experiment 5:**

|  |  |  |
| --- | --- | --- |
| **Table 5.1** | | |
| Trial | First | Second |
| Initial position |  |  |
| Minima Traversed |  |  |
| Final Position |  |  |
| λ |  |  |
| Average Wavelength: | |  |
| frequency | |  |

Do step A

**Q5.1)**

Do steps B, C and D

Repeat for step E to fill in second set of data.

**Q5.2)** Show work

**Q5.3)**

|  |  |  |
| --- | --- | --- |
| **Table 7.1** | | |
| Trial | First | Second |
| x1 |  |  |
| Minima Traversed |  |  |
| x2 |  |  |
| λ |  |  |
| Average wavelength | |  |
| % error | |  |

***Experiment 7:***

Do steps A through D.

Do step F to repeat the data

Do step G to finish the table

**Q7.1)**

**Q7.2)**

**Experiment 9:**

|  |  |  |
| --- | --- | --- |
| **Table 9.1** | | |
| Trial | First | Second |
| h1 |  |  |
| h2 |  |  |
| **d1** |  |  |
| λ |  |  |
| Average wavelength | |  |
| % error | |  |

Do steps A-F

Do step G and repeat it for step H with the second set of data

Show work once.

Repeat these measurements in step H

Do step I to finish the table.

**Q9.1)**

***Experiment 11:***

|  |  |  |
| --- | --- | --- |
|  | |  |
| **Table 11.1** | | |
| Angle | Meter Reading  (Vertical Polarization) | Meter Reading  (Horizontal Polarization) |
| 25° |  |  |
| 30° |  |  |
| 35° |  |  |
| 40° |  |  |
| 45° |  |  |
| 50° |  |  |
| 55° |  |  |

Do steps A-D.

This procedure is sensitive and tricky, do it carefully and slowly.

Do step E and print the graph

**Q11.1)**

**Q11.2)**