Waves A & B Worksheet
revised July 21, 2004

Your Name: ________________________________  Signature: ________________________________

Lab partner(s): _________________________________________________________________________

Course & Section: ___________________  Station # _________________ Date: _________________

Waves – A

Single Slit Diffraction (Section D.1)

What is the total separation between the first minima on either side of the central maxima for slit B?

_______ ± _______ (units)

Your estimate of $\lambda$:

Slope = _______ ± _______ (units)

$\lambda$ = _______ ± _______ (units)

Double Slit Diffraction (Section D.2)

Single slit diffraction features from slits “A”: the total separation in mm between the first minima corresponding to single slit diffraction is: _______ ± _______ (units)

Double-slit interference pattern:

Number $n$ of bright spots in the central diffraction maximum: _______

Width $s$ of central diffraction maximum: _______ ± _______ (units)

Mean separation $\Delta y$ of interference maxima: _______ ± _______ (units)

$\lambda$ from your data and Eq. 5 _______ ± _______ (units)

Diffraction Grating (Section D.3)

Measure the positions of the left $y_-$ and right $y_+$ maxima in first and second order. Calculate $\lambda$ using Eq. 3 for each measurement and then combine all four to obtain a mean $\lambda$.

$m = 1$: $y_+ = _____ ± _____ (units)$  $\lambda = _____ _____ (units)$

$y_- = _____ ± _____ (units)$  $\lambda = _____ _____ (units)$

$m = 2$: $y_+ = _____ ± _____ (units)$  $\lambda = _____ _____ (units)$

$y_- = _____ ± _____ (units)$  $\lambda = _____ _____ (units)$

$\lambda_{mean} = _____ _____ (units)$
Waves – B

Polarization by Transmission (Section C.3 & C.4)

Attach your Origin plot and least-squares fit of the intensity $I$ vs. angle $\theta$.

List here your fitted parameters:

$A = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$I_0 = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$\phi = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

Polarization by Reflection (Section D.2 & D.3)

$H_{\text{eye}} = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$L_{\text{eye}} = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$\tan \theta_{\text{eye}} = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}}$

$H_{\text{bulb}} = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$L_{\text{bulb}} = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$\tan \theta_{\text{bulb}} = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}}$

Index of refraction: ______________________

Michelson Interferometer (Section E.2 & E.3)

Each lab partner must count her or his own $N = 50$ or so fringes.

Number of fringes, $N = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}}$

Micrometer Reading, $\Delta d = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

$\lambda = \underline{\underline{\text{______}}} \pm \underline{\underline{\text{______}}} \quad \text{(units)}$

GRADE: _______ (out of 30 points)

GRADED BY _______ (TA’s initials)