Name:……. **Section:……**

Diffraction & Interference

Part 1: Single slit diffraction

Slit label	Slit width **d** (mm)	Width of central max **W** (mm)	Calculated Wave length **λ** (nm)	**% uncert**	wave length with **absolute uncertainty** (Sig figs must be correct. See how to do below*) **λ ± δλ** (nm)
A				+/- 25	
B				+/- 12.5	
C				+/- 6.25	
D				+/- 3.13	

Distance to the screen D = 4000 mm

Wave length λ is given by $\boxed{\lambda = \frac{W}{2D}\, d}$

Part 2: Double slit interference

Slit label	Slit spacing **d** (mm)	Number of tick marks used **(n-1)**	**2y (measured distance)** (mm)	$\mathbf{y_{average}}$ (mm)	Calculated Wave length **λ** (nm)	**% uncert**	Calculated Wave length **λ ± δλ** (nm) Sig figs must be correct
A						2	
B						1	
C						2	
D						1	

Distance to the screen D = 4000 mm.

Wave length λ is given by, $\lambda = \frac{d_{slit\ spacing}}{D}\left(\frac{2y}{n-1}\right) \Rightarrow \quad \boxed{\lambda = \frac{d_{slit\ spacing}}{D}\, y_{average}}$

*__How to do uncertainty__ (i.e., fill in last columns of data tables above). Say you calculated a wavelength of 616.9 nm with an uncertainty of 12.5% or **616.9nm +/- 12.5 %.**

Writing in absolute uncertainty gives you a 616.9 +/- 77,1 nm. Written with correct sig figs we have **620 +/- 80** nm. Note that uncertainty is one sig fig. *It is ok to have two fig figs for uncertainty **when the uncertainty starts with a one** (e.g., as +/- 144 nm, which would be written as +/- 140 nm)*