PHYS 201 **Pre-Lab 01**

Interference and Diffraction Using Visible Light

Name:_____ **Sec./Group**_____ **Date:**_____

1. In this experiment, a red laser will be used instead of a light bulb to demonstrate that visible light can behave like waves. What is the difference between light waves coming from a lightbulb and from a laser, in terms of wave frequency and phase ?

2. The largest and smallest slits in these experiments are 0.16mm and 0.04mm wide, respectively. The wavelength of the laser light is 650nm. How many wavelengths wide are these slits?

3. If one shines a laser with wavelength λ = 650 nm through a *single* slit of width a = 0.04 mm, draw the diffraction pattern you might expect on a screen 10 m behind slit. How far apart are the minima ?

4. In the macroscopic world, you know that *you can hear but cannot see around corners.* Under what conditions does light bend around corners (i.e. diffract) ? Explain why sound diffracts easily around a classroom door.

5. Suppose you added to the single slit an identical slit a distance d=0.25mm away from the first. Draw the resulting interference pattern you might expect on the same screen. What happens when we increase the distance between slits ? What happens in the limit that *d* becomes arbitrarily large?