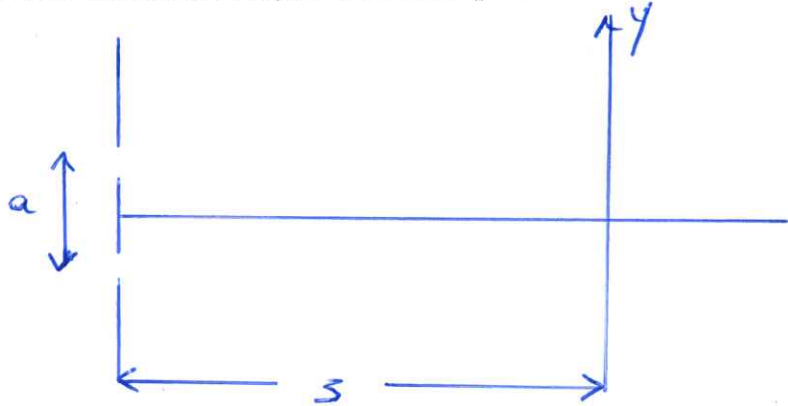


### Quiz 8

Name: \_\_\_\_\_

Total = 10 marks

1. (4 marks) Light is incident on a pair of slits separated by 1 mm. The diffraction signal is observed on a screen 3 meters from the slits. Find the wavelength of light if adjacent maxima of the interference signal are 2 mm apart.



Location of Maxima at:  $\frac{y a \pi}{s \lambda} = n \pi$

$$y_n = \frac{n s \lambda}{a}$$

Distance between adjacent maxima  $\Delta y = \frac{s \lambda}{a}$

$$\lambda = \frac{a \Delta y}{s}$$
$$= \frac{10^{-3} \text{ m} \times 2 \times 10^{-3} \text{ m}}{3 \text{ m}}$$

$$= 6.6 \times 10^{-7} \text{ m}$$

$$\lambda = 660 \text{ nm} \quad \text{Red Light.}$$

2. (4 marks) Michelson interferometer  
a) Sketch a Michelson interferometer.

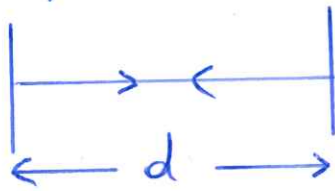
*See lecture notes.*

- b) What famous experiment was carried out using a Michelson interferometer and what did it show?

*See lecture notes.*

3. (2marks) What is the difference between a confocal Fabry Perot interferometer and a regular Fabry Perot interferometer?

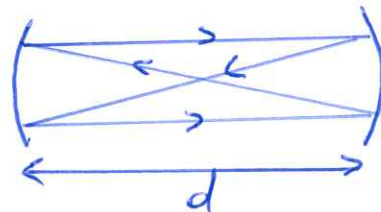
*Regular F.P.*



*Round trip = 2d*

$$\therefore \nu_{FSR} = \frac{c}{2d}$$

*Confocal F.P.*



*Round trip = 4d.*

$$\therefore \nu_{FSR} = \frac{c}{4d}$$