



# 3055 BA SANGAM COLLEGE

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## WORKSHEET 12

SCHOOL: BA SANGAM COLLEGE

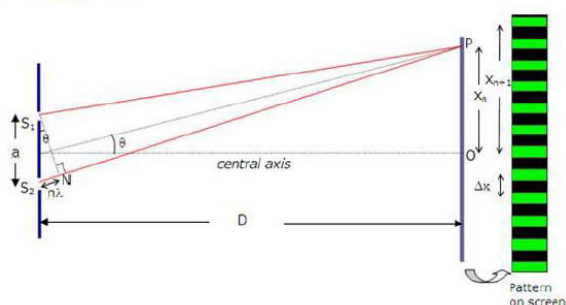
YEAR 12

SUBJECT: PHYSICS

NAME OF STUDENT: \_\_\_\_\_

STRAND	<b>GEOMETRICAL OPTICS AND WAVE MOTION</b>
SUB-STRAND	<i>Waves</i>
Content Learning Outcome	➤ Investigate the behavior of light and other waves under various conditions, with reference to the properties of waves

Young's Experiment:



$$n \lambda = \frac{xd}{L}$$

$$(1) \quad (10^{-6}) = x \cdot 1 \times 10^{-3} / 2$$

$$x = 2 \times 10^{-3} \text{m}$$

In Young's Interferometer the monochromatic light (light of one colour) from the source is divided into two parts using double slit arrangement.

The distance used to determine interference Light source to double slits: 20 – 100cm Slit to screen: 1 – 5 meters Slit width: 0.1 – 0.2 mm distance between slits: less than 1mm.

We get Constructive Interference if:

$$d \sin \theta = n \lambda = \frac{xd}{L}$$

And Destructive Interference

$$d \sin \theta = (n - \frac{1}{2}) \lambda = \frac{xd}{L}$$

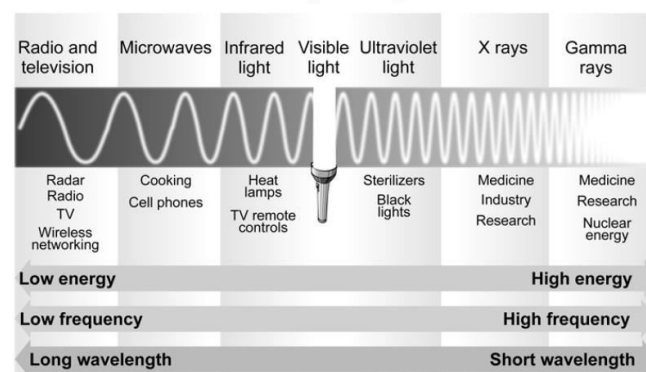
**Example:**

Find the position of the First bright band from the central bright band if  $n=1$ ,  $d=1\text{mm}$ ,  $L=2\text{m}$  and wavelength  $=10^{-6} \text{m}$

## The electromagnetic spectrum

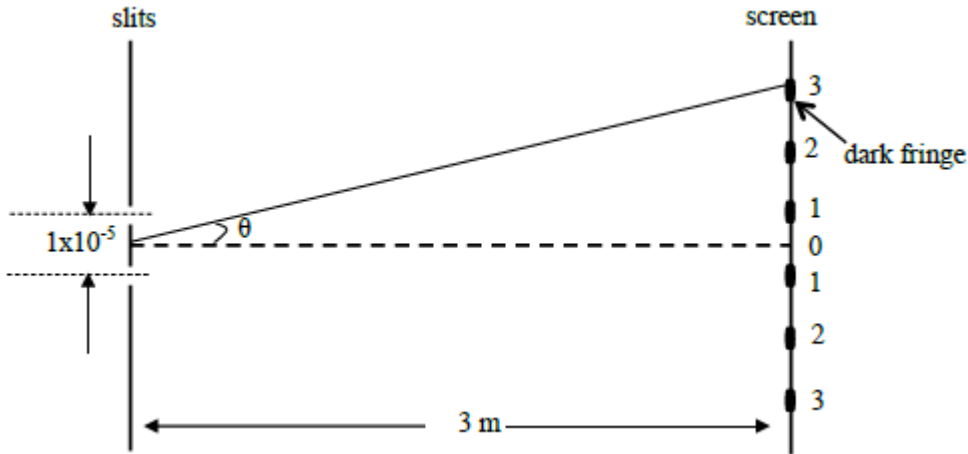
Radio waves, microwaves, visible light, and x-rays are familiar kinds of electromagnetic waves. All of these waves have characteristic wavelengths and frequencies. Wavelength is measured in meters. It describes the length of one complete oscillation. Frequency describes the number of complete oscillations per second. It is measured in hertz, which is another way of saying "cycles per second." The higher the wave's frequency, the more energy it carries.

### The Electromagnetic Spectrum



Exercise 1

Monochromatic light of wavelength 700 nm passes through two slits  $1 \times 10^{-5}$  m apart and shines on a screen 3 m away. Bright and dark fringes are formed as shown below



At what angle to the central antinodal line is the 3<sup>rd</sup> dark fringe formed? (2 marks)

Exercise 2

Explain the term dual nature of light.

(2 marks)