INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad – 500 043

LABORATORY WORK SHEET

Date: 10/06/2022

Roll No: 2195IA6754 Name: P. JYOTHI PRASANNA

Exp No: 01 Experiment Name: DIFFRACTION GRATING

DAY TO DAY EVALUATION:

	Preparation	Algorithm / Performance in the Lab	Source Code / Calculations and Graphs	Program Execution / Results and Error Analysis	Viva	Total
Max. Marks	4	4	4	4	4	20
Obtained	4	4	4	4	4	20

Sign
Signature of Lab I/C

START WRITING FROM HERE:

AIM: To determine the wavelength of a given source of laser using a plane transmission grating.

APPARATUS:
1) Plane diffraction grating
2) laser source
3) Scale
4) Prism table

FORMULA:

$$\lambda = \frac{2 \cdot 54 \sin\theta}{n \cdot N}$$

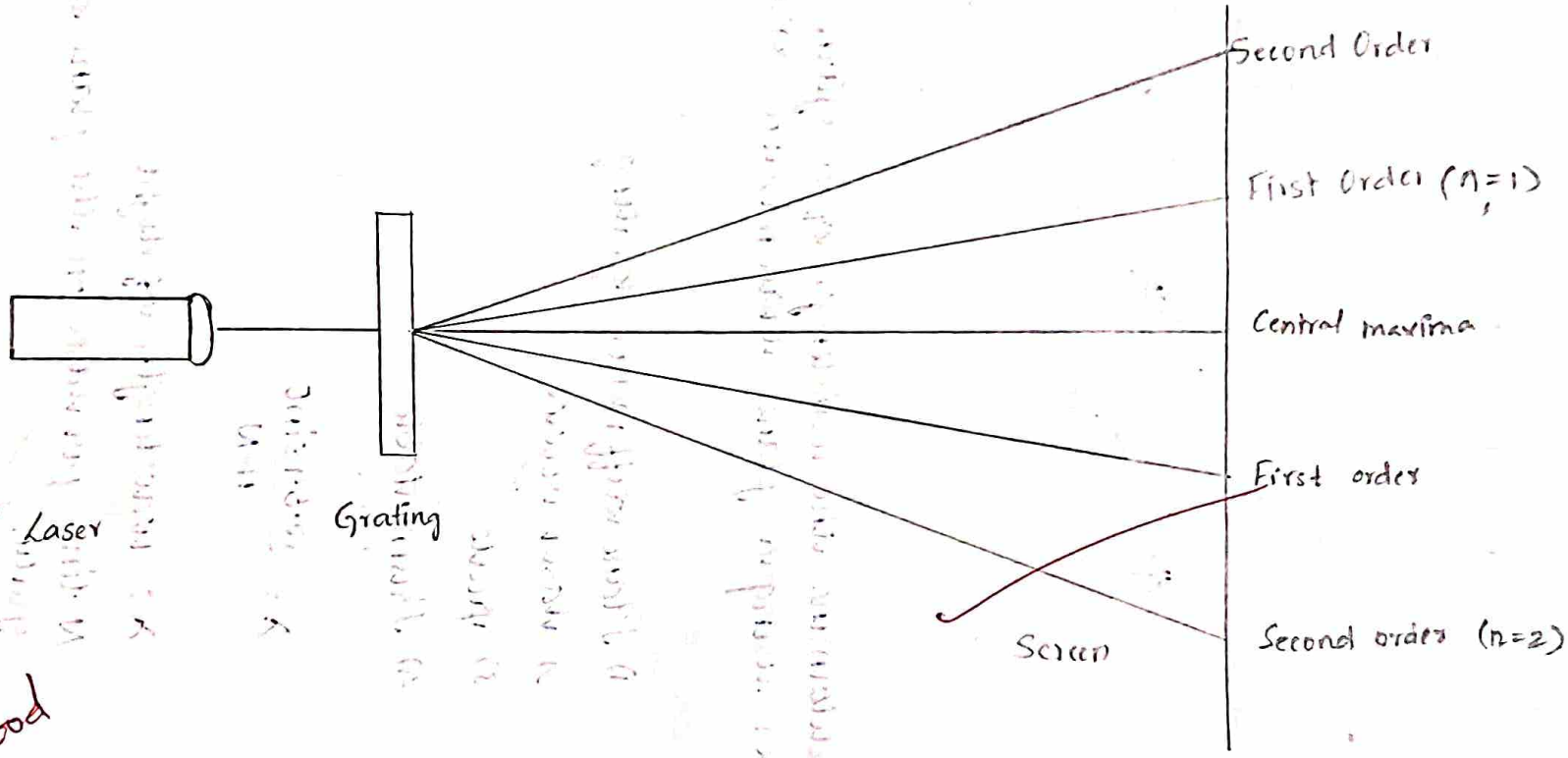
where

λ = wavelength of light

N lines per each on the plane diffraction grating.

n: order of diffraction light. (15000)

PIAGRAM:



V-good

Tabular form:

S.No.	Distance (D)	Order (n)	Left Side (d_1) (cm)	Right Side (d_2) (cm)	$d = \frac{d_1 + d_2}{2}$ (cm)	$\sin\theta = \frac{d}{\sqrt{d^2 + D^2}}$	$\lambda = \frac{2.54 \sin\theta}{n \cdot N}$ (A°)
1	94cm	1	33	32.5	32.5	0.32	5418.6
	94cm	2	78.5	65.5	98.5	0.66	5588
2	97cm	1	33.5	34	33.75	0.32	5418.6
	97cm	2	82.5	87.5	84.75	0.65	5503.3

RESULT:

Wavelength of given laser light = 55033 A°

Sayak

VIVA VOCE:

1) Define spontaneous emission.

A) The atom in the excited state returns to the ground state thereby emitting a photon, without any external inducement is called spontaneous emission.

2) Define stimulated emission.

A) Stimulated emission is the process by which an incoming photon of a specific frequency can interact with an excited atomic electron (or other excited molecular state), causing it to drop to a lower energy level.

3) What is diffraction?

Diffraction refers to various phenomena that occur when a wave encounters an obstacle or opening. It is defined as the interference or bending of waves around the corners of an obstacle or through an aperture into the region of geometrical shadow of the obstacle.

4) State the characteristics of LASER?

A) The characteristics of LASER are: It is

i) Coherent

ii) Directional

(iii) monochromatic