Class: Roll No:

Experiment No:1

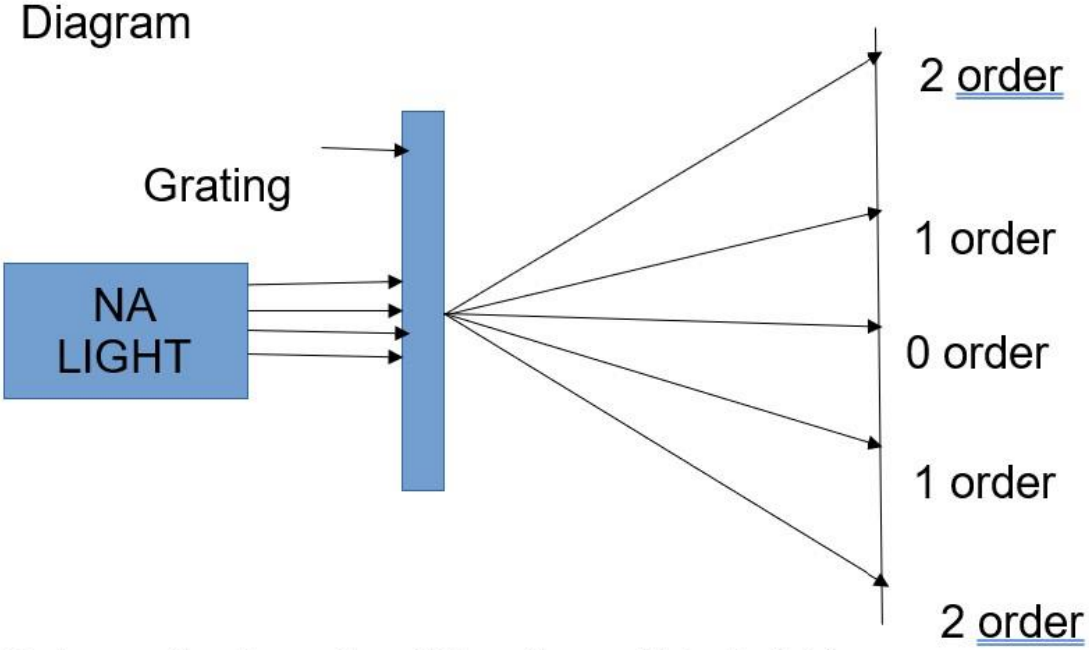
To Determine the Wavelength of Sodium Light using a Diffraction Grating and Spectrometer.

Date Of Preparation:

Date of Submission:

Signature of Teacher:

Diagram



Schematic diag. for diffraction of Na light by Grating and Spectrometer

EXPERIMENT NO. 1

AIM: To determine the wavelength of sodium light using a diffraction grating and spectrometer

APPARATUS : Diffraction grating, spectrometer, Sodium lamp, reading lens

THEORY: A plane diffraction grating is an arrangement of a large number of identical equidistant parallel slits. When a beam of monochromatic light is incident normally on the grating surface, it gets diffracted through various angles to give a diffraction pattern made of zero order, first order, second order and higher orders depending on the grating element d, (distance between two consecutive slits) and the wavelength of light being used. The grating equation relates the grating element (d), the wavelength of incident light (λ) and the angle of diffraction (Θ) for a given order (m) and is given by

$$\mathbf{d \sin \Theta = m \lambda}$$

OBSERVATION TABLE: Grating Element (d) = (2.54/15000) cm

Order of maxima (m)	Spectrometer reading (L.H.S.) a (degrees) (MSR + VSR)	Spectrometer reading (R.H.S.) b (degrees) (MSR + VSR)	(a~b)= 2Θ	Angle of diffraction (Θ)	Calculated wavelength (λ) (Å)	Average wavelength (λ) (Å)
0						
1						
2						

CALCULATIONS: **$d \sin \Theta = m \lambda$ (m-1)**

$d \sin \Theta = m \lambda$ (m-2)

RESULTS : The Average calculated value of wavelength = _____ (Å)

The standard value of wavelength = _____ (Å)

Percentage Error = _____ %