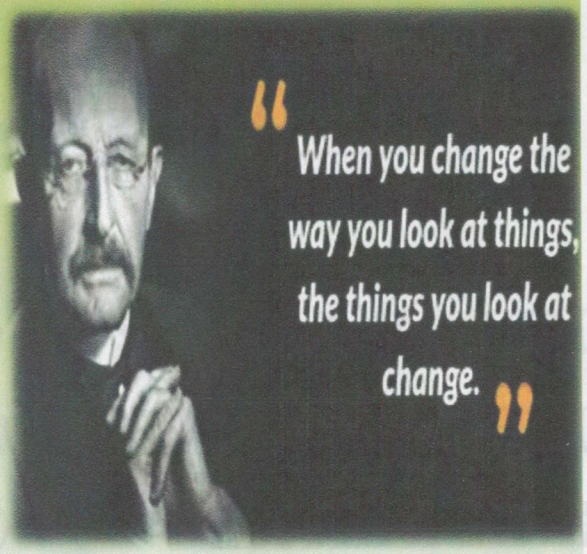
# SB ARTS AND KCP SCIENCE COLLEGE
# VIJAYAPURA

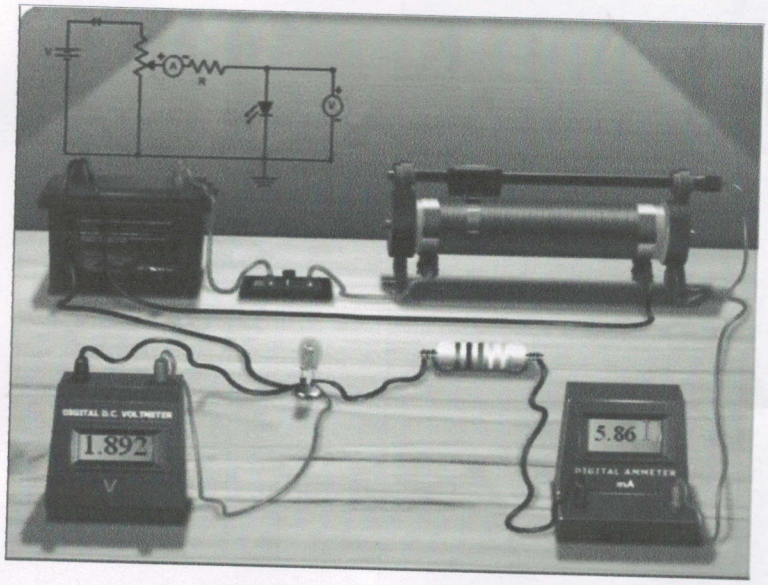
## SEMINAR

## PLANKS CONSTANT




BY

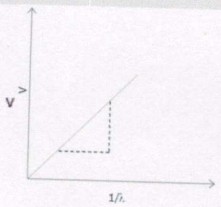
| | | |
|---|---|---|
| SAMEER WALIKAR | 04 | S. Bwalikar |
| SADEEQ WALIKAR | 05 | S. Bwalikar |
| SOHAIL KHATIB | 03 | |
| VIKRAM | 02 | |
| SHAMEER JATGAR | 18 | |
| AFRIDI NABIWALE | 20 | |




## TABULAR COLUMN AND NATURE OF GRAPH

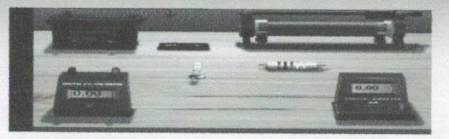
| COLOUR OF LED | WAVELENTH λ in nm | $\frac{1}{\lambda}\ 10^{-3}$ | KNEE VOLTAGE V | λV | $h=\frac{e\lambda V}{c}$ In js |
|---|---|---|---|---|---|
| red | 660 | | | | |
| yellow | 580 | | | | |
| green | 540 | | | | |
| white | 550 | | | | |
| orange | 590 | | | | |

Knee voltage is the voltage at which the bulb start glowing .



## Aim : Determination of Planck's

- **Apparatus** : power supply, a one way key, a rheostat, a digital milliammeter, a digital voltmeter, a 1K resistor and different known wavelength LED's (Light-Emitting Diodes).



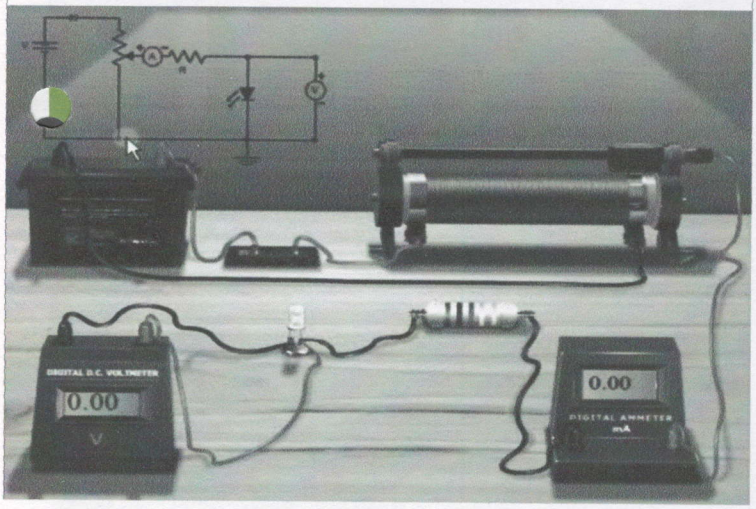
- **Formula** Planck relation:

$$E = h\nu = \frac{hc}{\lambda}$$

where:

E = energy
h = Plank constant
v = frequency
c = speed of light
$\lambda$ = wavelength

## CONSTRUCTION AND PROCEDURE



## CALCULATIONS

$h = \frac{e\lambda v}{c}$ $\quad c = 3 \times 10^8$ m/s

$e = 1.60217662 \times 10^{-19}$ coulombs

## result:

hence we determine the value of planks constant of different color's of different wavelength by taking average of all the results.

BLDEA' s Association

# SB ARTS & KCP SCIENCE COLLEGE VIJAYAPUR -586103

## Subject :HALL EFFECT

**Presented By :**

| Name : | No. |
|---|---|
| Ayesha | 06 |
| Nikita | 10 |
| Megha | 13 |
| Ashwini | 19 |
| Sonali | 16 |

# INTRODUCTION:

## Hall effect

**Definition :**

If a piece of conductor (metal or semiconductor) carrying current is placed in a transverse magnetic field , an electric field is produced inside the conductor in a direction normal to the both the current and the magnetic field. This phenomenon is known as the Hall Effect. And the generated voltage is called as the Hall Voltage.

# Aim:

Use of Hall effect to setup determine the foll wing for a given semiconductor specimen

1.Hall coefficient

2.Hall mobility

3.Carrier concentration

## Apparatus:

Hall probe, connecting wires ga ss meter , digital voltmeter, 2 solenoids,etc.

# FORMULA:

Hall coefficient RH $= \frac{tVH}{HI}$ (In ΩM/T)$=\frac{t}{H}$* Slope

Carries concentration n = $3\frac{\Pi}{8eRH(in\ m^{-3})}$

Hall mobility $\mu=\frac{8}{3\Pi}$ σRH $= \frac{8}{3\Pi}$RH*$\frac{1}{\rho}$(in $m^{-2}s^{-1}$)

where $\rho= \frac{bt}{l}*V_H/I$

. Relaxation time,$\tau=^{\mu m}/_{e}$(in ρ)

vhere VH-Hall voltage(in volts)

I-Magnetic field(in A)

μ-Magnetic field(in tesla)

E-charge of electron

m-mass of electron

t-thickness of specimen(in m)

l-length of specimen(in m)

b-breadth of specimen(in m)

# Circuit Diagram:

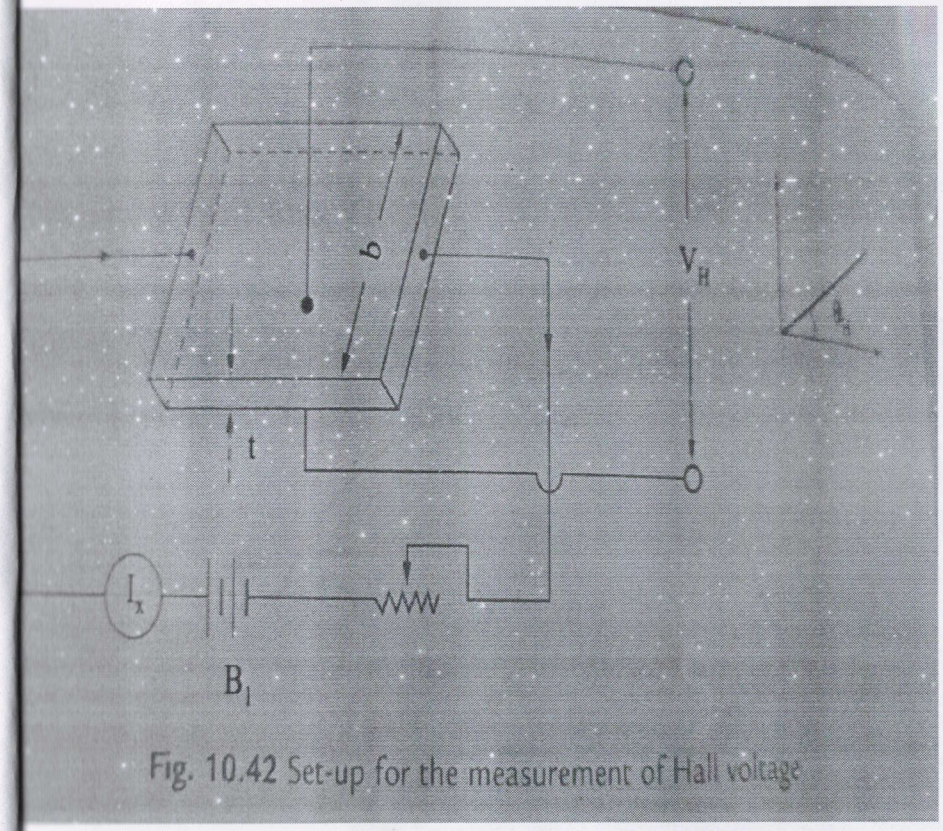
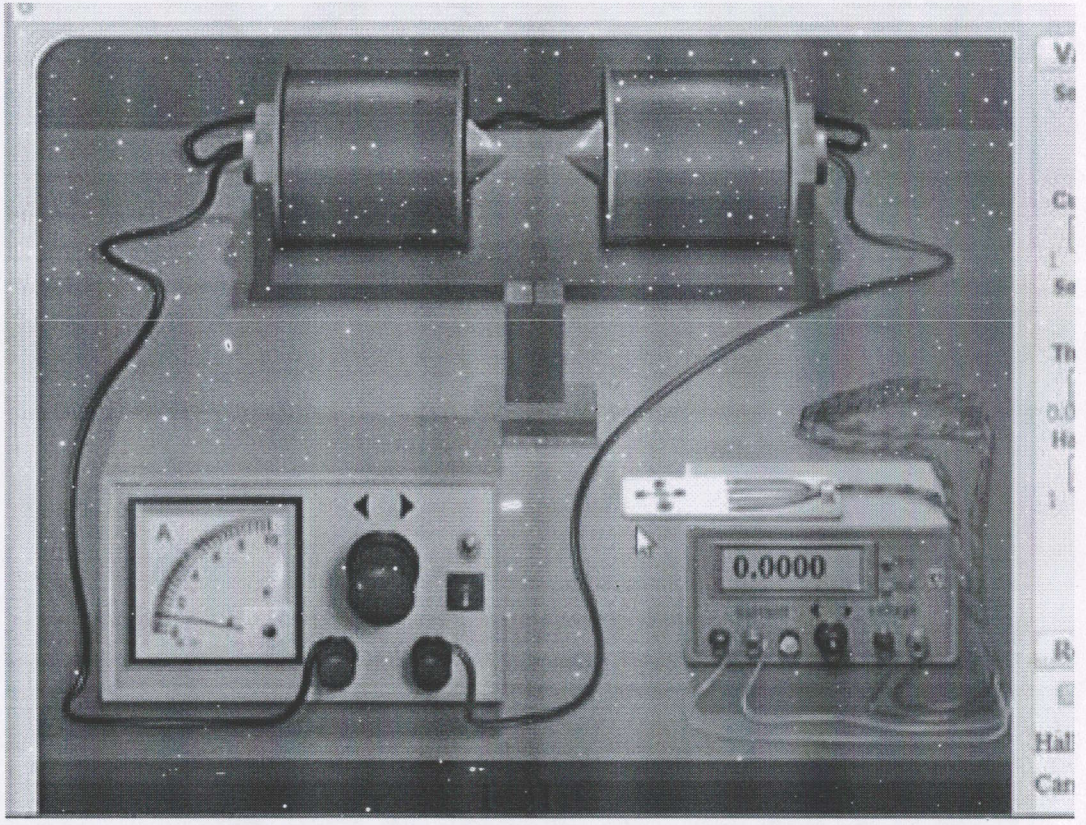
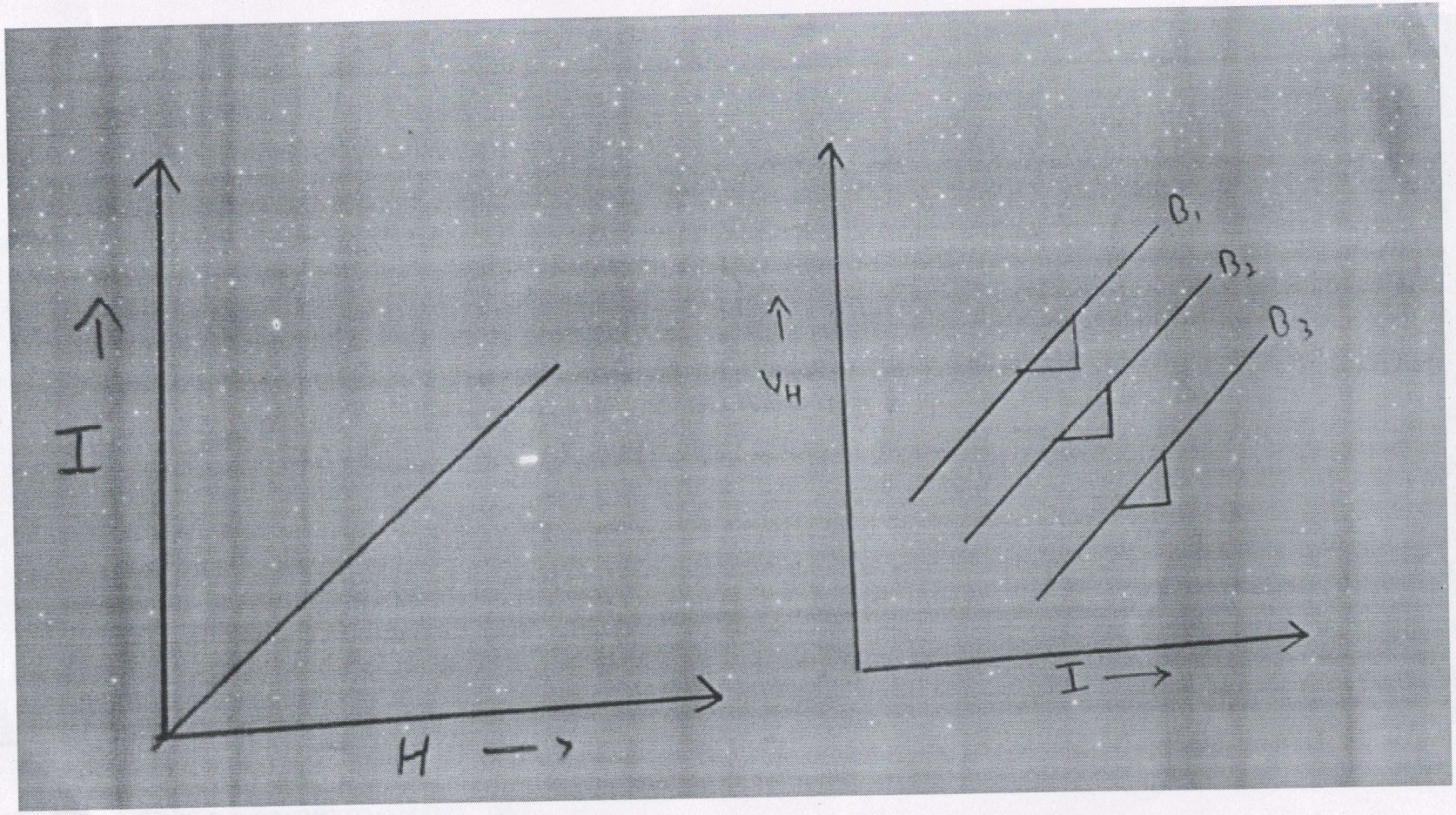



Fig. 10.42 Set-up for the measurement of Hall voltage



# Nature of graph:



# Theory:

**Working:**

A rectangular slab of the given material having a thickness $t$ and width $b$ is taken and a current $I_x$ ampere is allowed to pass through this sample by connecting it to the battery $B_1$. The slab is then placed between two pole pieces of an electromagnet such that if the current direction coincides with the *x-axis*, the magnetic flux density $B$ coincides with *x-axis*.

The Hall voltage $V_H$ is then measured by placing two probes at the centres of bottom and top faces of the sample. If the magnetic flux density is $B$ weber/$m^2$ and the Hall voltage is $V_H$ *volts,* then $R_H$ is obtained.

# Procedure

- Connect constant current source to the solenoid
- Probes are connected to the gauss meter and laced at the middle of the two solenoids.
- Switch on the gauss meter and constant current source.
- Vary the current through the solenoid from 1 amp to 5 Amp with the interval of 0.5 A, and note the corresponding gauss meter readings.
- Switch off the gauss meter and constant current source and turn the knob of constant current source towards min current
- Fix the hall probe on a wooden stand. Connect green wire to constant current generator and connect red wires to milli voltmeter in the hall effect apparatus
- Replace the probe with hall probe and place the sample material at the middle of the two solenoids
- Switch on the constant current source and CCG
- Carefully increase the current I from CCG and measure the corresponding hall voltage VH. Repeat this step for different magnetic field B
- Thickness t of the sample is measured using screw gauge.
- Hence calculate the hall coefficient and carrier concentration "n."

# Observation:

1. Sample used-Germanium
2. Thickness of sample t=0.5mm
3. Length of sample l=7mm
4. Breadth of sample b=7mm
5. Charge of electron $e=1.6*10^{-19}$
6. Mass of electron $m=9.1*10^{-31}kg$

# Tabular column:

| Constant current I in mA | MAGNETIC FIELD H | |
|---|---|---|
| | H in G | H in tesla |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

BLDEA' s Association

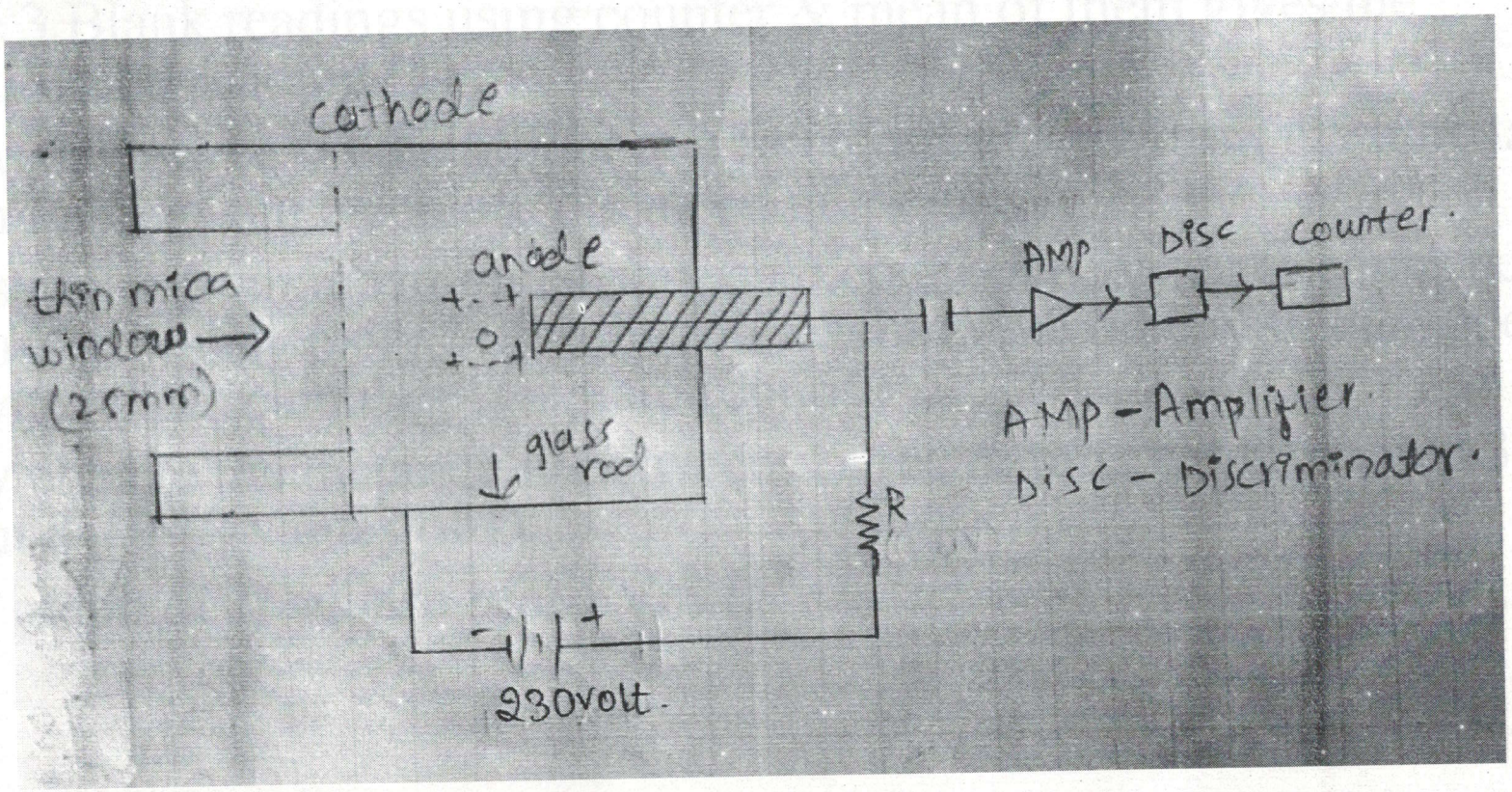
# SB ARTS & KCP SCIENCE ~~PU~~ COLLEGE
# VIJAYAPUR -586103

Subject : Inverse Square Law

Presented By :

| Name : | Roll No. |
|---|---|
| **Ayesha** | **06** Awatandary. |
| **Nikita** | **10** |
| **Megha** | **13** |
| **Ashwini** | **19** |
| **Sonali** | **16** Sonali |

# Circuit Diagram



## PROCEDURE:

- Connect the gm to counter scale and power supply.
- Take 3 Blank readings using counter & mean of them gives the background reading B.
- Place the source on the holder at a fixed distance D from the tube take two readings and calculate the mean of them.
- Substract b from mean gives corrected count per 30 sec & count per second gives intensity I of radiation reaching the tube with distance D between them calculate1/ square root of I
- Now change the distance D between source & tube continue step 3 for about 8-10 10 values of D
- Plot graph of 1/ square root I V/S D