

**EXPERIMENT NUMBER – 1**

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BRANCH B.Tech (CSE).	SECTION/GROUP – 26(B)
SEMESTER – 2 <sup>ND</sup>	DATE – 15/02/2021

**NAME OF THE EXPERIMENT-**

**To determine hall voltage and hall coefficient using hall effect.**

**APPARATUS-**

Two solenoid, constant current supply, Four probe, Digital gauss meter, Hall effect apparatus (which consist of Constant Current Generator (CCG), digital milli voltmeter and Hall probe).

**OBSERVATIONS-**

Thickness of semiconductor in Hall probe,  $t=0.0002\text{m}$ .

S No.	Current I (A)	Magnetic Field (Tesla)
1.	1	0.1482
2.	1.5	0.2223
3.	2	0.2964
4.	2.5	0.3706
5.	3	0.4447
6.	3.5	0.5188
7.	4	0.5929
8.	4.5	0.6670
9.	5	0.7411

S No.	Magnetic Field (Tesla)	Hall Current (mA)	Hall Voltage (mV)	Hall Coefficient
1.	0.1482	14.378	1	0.01940
2.	0.1482	21.567	1.5	0.01940
3.	0.1482	28.756	2	0.01940
4.	0.1482	35.945	2.5	0.01940
5.	0.1482	43.133	3	0.01940
6.	0.1482	50.322	3.5	0.01940
7.	0.1482	57.511	4	0.01940
8.	0.1482	64.700	4.5	0.01940
9.	0.1482	71.889	5	0.01940

## OBSERVATIONS-

Calculations

Formulae to be applied

$$\text{Hall Volt } (V_H) = \frac{I B}{n e t}$$

$$R_H = \frac{V_H \times t}{I \times B}$$

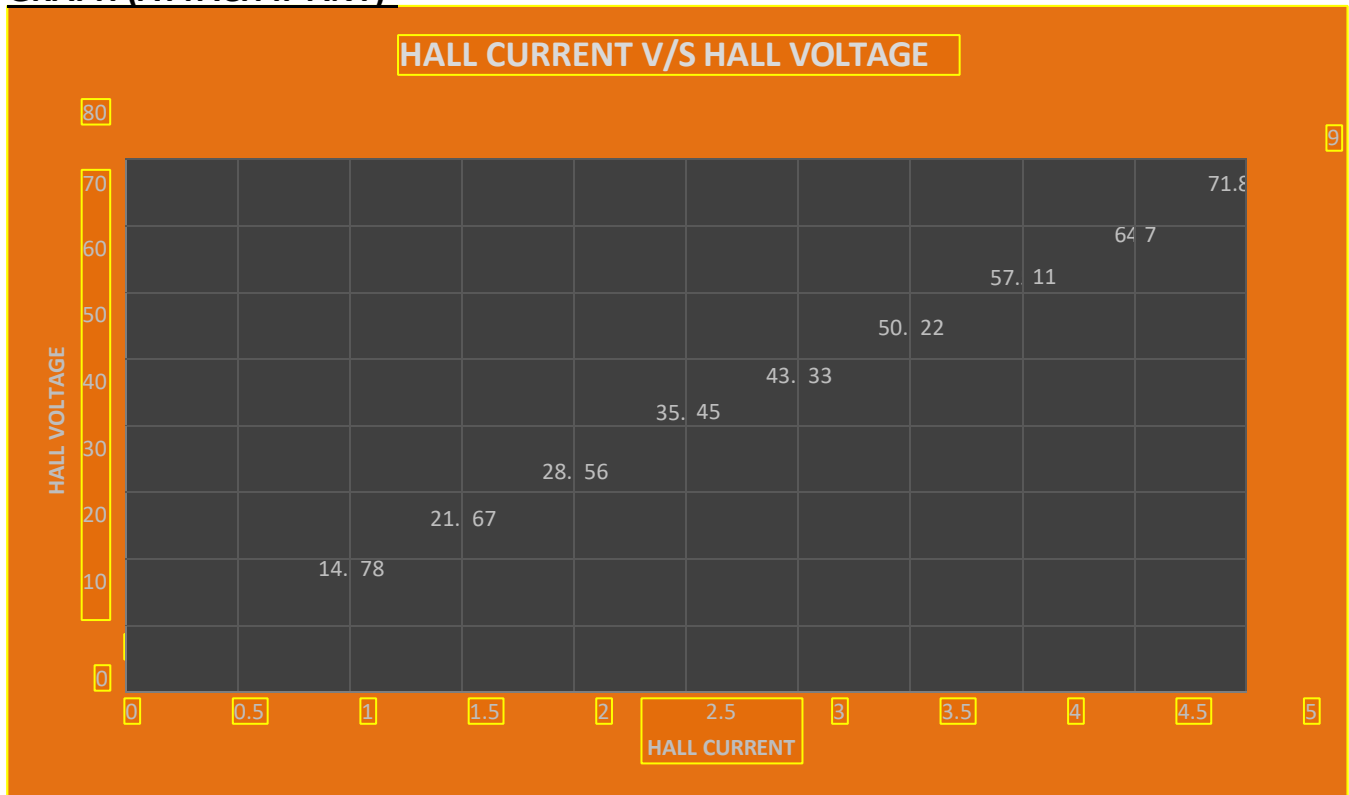
where  $R_H$  = Hall Coefficient  
 $V_H$  = Hall Voltage  
 $t$  = Thickness

From observation

$$\text{mean } V_H = \frac{388.202}{9} = 43.1335 \text{ mV}$$

$$\& R_H = 0.01940 \text{ (Vm/A Tesla)}$$

**GRAPH (ATTACH IF ANY)-**



**RESULTS AND DISCUSSION-**

1. The observed Hall voltage = 43.1335 millivolt
2. Hall coefficient of the material = 0.01940 volt m/amp tesla

**SOURCES OF ERROR-**

1. There should be no magnet, magnetic substances and current carrying conductors near the apparatus.
2. The plane of the coil should be set in the magnetic meridian.

**CONCLUSION-**

**In conclusion, the Hall effect was verified. As long as the magnetic field and the current stayed below some threshold, there was a linear relationship between the voltage measured, and the current and B field applied.**

## LEARNING OUTCOMES

- It will provide the modest experience that allows students to develop and improve their experimental skills and develop ability to Analyze data.
- Ability to demonstrate the practical skill on measurements and instrumentation techniques of some Physics experiments. Students will develop the ability to use appropriate physical concepts to obtain quantitative solutions to problems in physics.
- Students will demonstrate basic experimental skills by setting up laboratory equipment safely and efficiently, plan and carry out experimental procedures, and report verbally and in written language the results of the experiment.
- Students will develop skills by the practice of setting up and conducting an experiment with due regard to minimizing measurement error.

## EVALUATION COLUMN (To be filled by concerned faculty only)

Sr. No.	Parameters	Maximum Marks	Marks Obtained
1.	Worksheet completion including writing learning objectives/Outcomes. (To be submitted at the end of the day)	10	
2.	Post Lab Quiz Result.	5	
3.	Student Engagement in Simulation/Demonstration/Performance and Controls/Pre-Lab Questions.	5	
4.	Total Marks	20	
5.	Teacher's Signature (with date)		