PPH319 PHYSICS LAB V

L	T	P	Cr
0	0	4	2

Course Objectives: To expose students to common semiconductor devices and their evaluation techniques.

List of Experiments:

1. To determine the resistivity and the band-gap of the given semiconductor sample using four probe technique.
2. Determine the Hall coefficient for given semiconductor and determine the dopant density and mobility for majority charge carriers.
3. Determine the band-gap of the given p-n junction using reverse saturation current.
4. Study the forward and reverse characteristics of given p-n junctions (at least 2) and determine materials constants, bandgap, variation of junction capacitance and the nature of the junction (abrupt/linearly graded).
5. Study the characteristics of a Zener diode, LDR and VDR.
6. Static characteristics and 90^0 phase control of a Silicon Controlled Rectifier (SCR)
7. To study the input and the output characteristics of the given bipolar junction transistor (CE, CB and CC).
8. To study the switching characteristics of a transistor (NPN& PNP).
9. Study the static drain and transfer characteristics (dynamic resistance of drain, mutual conductance and amplification factor) of a JFET at a given operating point.
10. To study MOSFET as output power amplifier and plot the static drain characteristics.
11. Gain and frequency characteristics of a double stage RC coupled BJT amplifier.
12. Study the spectral output of the given lamp and use it to determine the intensity and spectral response of the given solar cell.
13. Study the I-V characteristics of the given solar cell.
14. Study the characteristics of the given photodiode and phototransistor.

Course learning outcomes: Students will have achieved the ability to:

1. evaluate some basic properties of semiconductor devices including resistivity, band gap, hall coefficient, light dependent resistance and voltage dependent resistance.
2. determine the behaviour of p-n junction including Zener diodes and SCR
3. evaluate the behaviour of FETs and BJTs
4. evaluate the working and spectral characterizations of solar cells
5. test and compare the theoretical concepts learned in the class with hands on experiments
6. analyze and interpret experimental data using graphs

Evaluation Scheme:

Sr. No.	Evaluation Elements	Weightage (%)
1	Lab Evaluation	100