



KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act 1956)

Coimbatore - 641021.

(For the candidates admitted from 2017 onwards)

DEPARTMENT OF PHYSICS

SUBJECT : WEATHER FORECASTING (PRACTICAL)

SEMESTER : VI

SUBJECT CODE: 16PHU511B

CLASS : III B.Sc.PHYSICS

Demonstrations and Experiments:

1. Study of synoptic charts & weather reports, working principle of weather station.
2. Processing and analysis of weather data:
3. To calculate the sunniest time of the year.
4. To study the variation of rainfall amount and intensity by wind direction.
5. To observe the sunniest/driest day of the week.
6. To examine the maximum and minimum temperature throughout the year.
7. To evaluate the relative humidity of the day.
8. To examine the rainfall amount month wise.
9. Exercises in chart reading: Plotting of constant pressure charts, surfaces charts, upper wind charts and its analysis.
10. Formats and elements in different types of weather forecasts/ warning (both aviation and non aviation)

Reference books:

1. Aviation Meteorology, I.C. Joshi, 3rd edition 2014, Himalayan Books
2. The weather Observers Hand book, Stephen Burt, 2012, Cambridge University Press.
3. Meteorology, S.R. Ghadekar, 2001, Agromet Publishers, Nagpur.
4. Text Book of Agrometeorology, S.R. Ghadekar, 2005, Agromet Publishers, Nagpur.

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BATCH-2017-2020

CALIBRATION OF THERMOCOUPLE

AIM:

To calibration the given thermocouple.

APPARATUS:

Multimeter, Cu-Fe Thermocouple, hot plate, beaker.

PROCEDURE:

A copper thermocouple is taken one of the junction of the thermocouple is kept at a liquid container and the other junction is kept at the cold water.

The terminal of the thermocouple and connected to the digital multimeter for different hot junction temperature are taken and heated.

Tabulate the readings and plot the graph.

The resulting curve obtained is called calibration curve.

OBSERVATION:

TIME(minute)	DC(mv)

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RESULT:

The given Cu-Fe thermocouple has been calibrated and graph has been plotted.

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V-I CHARACTERISTICS OF SOLAR CELL

AIM:

To plot the V-I Characteristics of the solar cell and hence determine the fill factor.

APPARATUS REQUIRED:

Solar cell mounted on the front panel in a metal box with connections brought out on terminals. Two meters mounted on the front panel to measure the solar cell voltage and current. Different types of load resistances selectable using band switch also provided on the front panel. Three single points and two interconnectable patch chords for connections. Wooden plank with half meter scale fitted on it and a lamp holder with 100 watt lamp.

PROCEDURE:

When experiment is performed with 100 Watt lamp: 1. Place the solar cell and the light source (100 watt lamp) opposite to each other on a wooden plank. Connect the circuit as shown by dotted lines (Fig. 2) through patch chords. 2. Select the voltmeter range to 2V, current meter range to 250 μ A and load resistance (RL) to 50 Ω . 3. Switch ON the lamp to expose the light on Solar Cell. 4. Set the distance between solar cell and lamp in such a way that current meter shows 250 μ A deflections. Note down the observation of voltage and current in Table 1. 5. Vary the load resistance through band switch and note down the current and voltage readings every time in Table 1. 6. Plot a graph between output voltage vs. output current by taking voltage along X-axis and current along Y-axis

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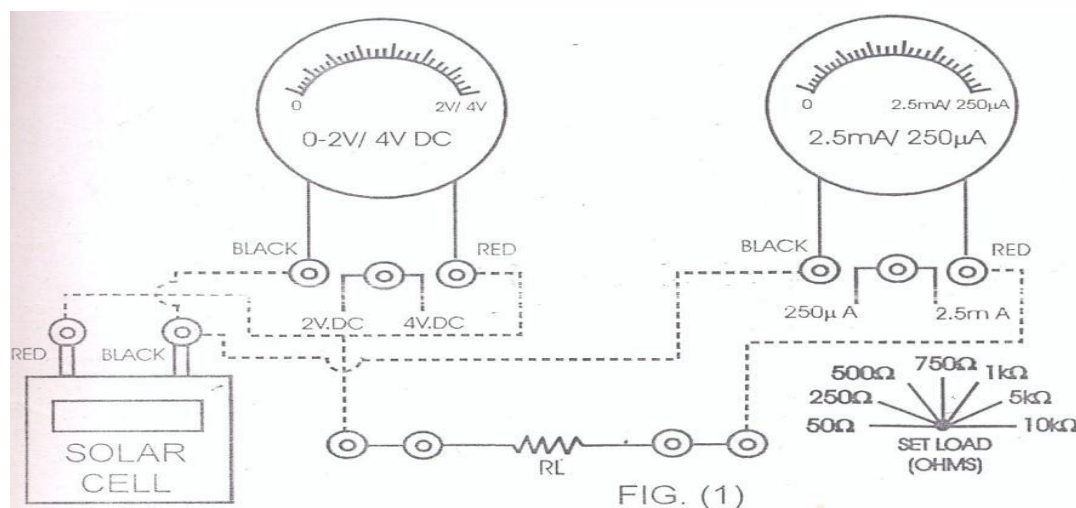
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OBSERVATIONS:

Voltmeter reading for open circuit, $V_{OC} = \dots$ Volts

Milliammeter reading with zero resistance, $I_{SC} = \dots$ mA.

L=40 cm

Load resistance(Ω)	Current(I)	Voltage(V)

L=50

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Load resistance(Ω)	Current(I)	Voltage(V)

Result:

The VI characteristics of solar cell has been drawn.

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SOLAR RADIATION

AIM:

To analyses the total solar radiation in local climate condition.

APPARATUS:

Solar radiation, monitor, sensors.

PROCEDURE:

Connect the solar radiation monitor with the sensor and power supply.

Place the sensor in a open source in that the solar radiation falls directly on it.

Observe the reading on the monitor for every ten minute.

Tabulate the readings and plot the graph.

OBSERVATION:

TIME(minute)	Solar radiation (w/m^2)

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RESULT:

The solar radiation has been analyzed in the climatic condition.

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WIND VELOCITY

AIM

To determine the value of wind velocity.

APPARATUS

Anemometer Cup, Stop watch.

PROCEDURE:

Place anemometer in open space with along and find it on the ground and leave it undisturbed.

When the wind blows the cups fixed along anemometer rotates along with of wind space.

Observe the reading on the observation table and plot the graph.

Tabulate the reading on the observation table and plot the graph.

OBSERVATION:

Time (minute)	Speed(km/hr)
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RESULT:

The total wind velocity has been determined

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PLANCK'S CONSTANT

Aim:

To determine the value of Planck's constant 'n' by a photo cell.

Apparatus:

Photo cell, monochromatic source of light, color filters, Planck's constant apparatus and connecting wire.

Formula:

The value of Planck's constant 'n' is given by

$$h = \frac{e(V_2 - V_1)\lambda_1\lambda_2}{c(\lambda_1 - \lambda_2)}$$

where

e-electronic charge

V₂-stopping potential corresponding to wavelength λ_2

V₁- stopping potential corresponding to wavelength λ_1

c-velocity of light.

Procedure:

The electrical connections made as follows

The lamp and scale arrangement adjusted to get a well focused spend on the zeromark of the scale, the photo cell in mounted at one end of the optical bench. At the same level and nearly

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60-80cm from the photo cell a light source is arranged. The light is allowed to follow on the cathode of the photo cell a the photo cell. New a suitable filter of known wavelength .

The negative anode potential is in small steps and each time corresponding deflection of the ammeter is noted till ammeter reading reaches zero.

The experiment is repeated after replacing particular filter in succession by two more filter.

Talking negative anode potential on X-axis and corresponding deflection on Y-axis graphs are plotted to different filter.

Result:

The value of planck's constant is 6.689×10^{-23}