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# ACTIVITY - 1

## OBJECT :-

To Assemble a house hold current comprising three bulbs, three (on/off) switches, a fuse and a power source.

## APPARATUS REQUIRED :

Three Bulbs (20W, 50W and 100W) three (on/off) switches, flexible connecting wire with red and black plastic covering, a fuse wire a two pin plug.

## PROCEDURE :

- i) The Bulb holders are connected in parallel with one end to the red flexible wire serving as live wire and other to the black flexible wire serving as neutral wire.
- ii) Three switches are connected across the two wires in each of the parallel arms.
- iii) A fuse is connected to the mains through a two pin plug, flexible wire serving as power source.

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iv) For Testing, the switches are made on, one by one and put off.

### OBSERVATIONS!

The Bulb glows when the switches is made on  
it stops glows when the switches is put off.



# ACTIVITY-2

## OBJECT :

To assemble given resistors in a suitable combination to obtain a desired resistance and verify its value with a multimeter.

## THINGS REQUIRED :

A-Multimeter, Resistors of known values connecting wires, sand paper.

## THEORY

When several resistors  $R_1, R_2, \dots, R_n$  are connected in series the Equivalent resistance is given by  $R_{eq} = R_1 + R_2 + \dots + R_n$ , when the resistors are connected in parallel, Equivalent resistance is given by,

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \dots + \frac{1}{R_n}$$

## PROCEDURE

The various resistances are connected in different combinations using different numbers. The range of the multimeter is adjusted and the pointer is set to zero after connecting two leads of multimeter

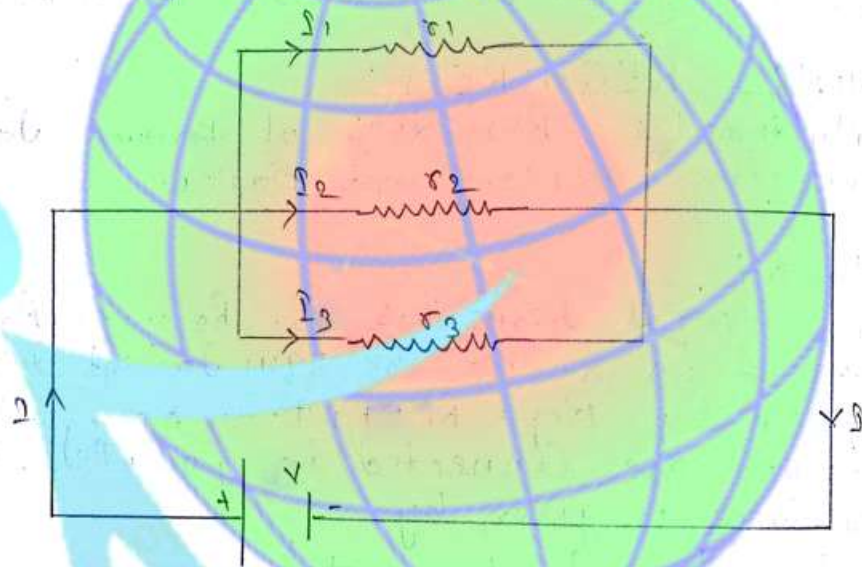
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2-VTHT2A

### Parallel Combination



Again the two leads are connected to the terminals of resistor circuit. Due to introduction of resistor the deflection becomes less. The position of the pointer against the resistance scale for the set range gives the values of the equivalent resistances.

Similarly the different combination of resistors are measured by changing the ranges and setting of zero after each change.

### CONCLUSION

The result are in agreement with formula.

### PRECAUTIONS

- i) zero should be set after each change
- ii) Heating of resistor should be avoided





# ACTIVITY → 3

## OBJECT

To find current by measuring voltage across a given resistor.

## APPARATUS REQUIRED

A Voltmeter and an ammeter of appropriate range, a battery, a rheostat one way key, a known resistor coil, connecting wire, a piece of sand paper.

## THEORY

If 'I' be the current at a potential difference of 'V' having resistances 'R' then,

$$R = \frac{V}{I}$$

$$I = \frac{V}{R}$$

## PROCEDURE

- i) The Apparatus is arranged as given in the arrangement
- ii) The Current to be measured is passed and the Voltmeter reading is noted.

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iii) The value of the given resistances is given.

iv) The current is calculated by the formula  
$$P = V/R$$

### PRECAUTIONS

- The connections should be tight.
- Thick copper wires should be used for making the connection.

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# ACTIVITY - 4

## OBJECT

To identify a Diode, A.L.E.D, a transistor, an R, a resistor and a Capacitor from a mixed collection of such items

## APPARATUS REQUIRED

Multimeter, a battery, Eliminator reversing key, and above mixed collection of items.

## THEORY:

- i) A Diode is a two terminal device which conducts when forward biased and does not conduct when reverse biased. It emits light when conducting.
- ii) A.L.E.D is also a two terminal device it also conducts when forward and does not conduct when reverse biased. It emits light while conducting.
- iii) A Transistor is a three terminal device the terminals represents emitter (E) Base (B) and collector (C)

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- iv) An IC is a multiterminal device in the form of a chip.
- v) A resistor is a two terminal device. It conducts even when operated with A.C Voltage.
- vi) A capacitor is a two terminal devices. It does not conduct when either forward or reverse biased. However it conducts with A.C Voltage.

### PROCEDURE

- i) If the item has four or more terminals having a form of chip it is an IC. If it has three terminals, it is a transistor. It may be Diode, LED, resistor or a capacitor.
- ii) For further differentiation a series circuit is made with battery eliminator. Reversing key, the item and the Multi meter with range set in milliampere. The Battery Eliminator is switched on.
- iii) If the pointer moves when voltage is applied in one way and does not move when reversed and there is light emission it is LED.

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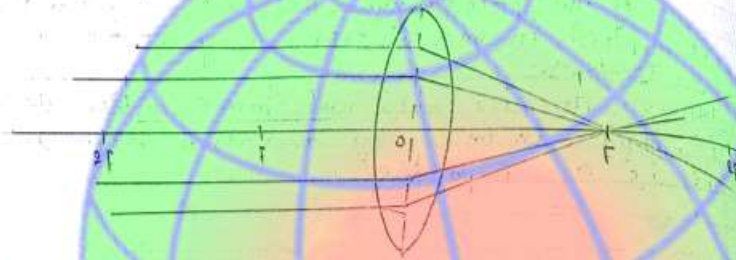


If the pointer does not move when voltage is applied in one either way it is a resistor.

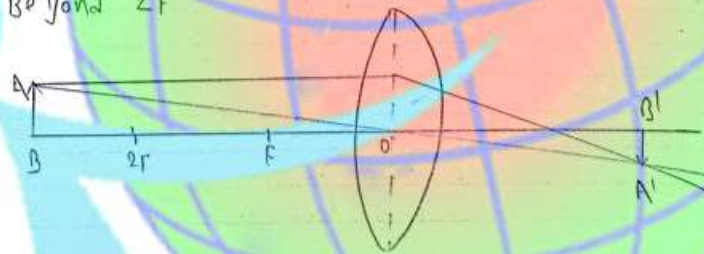
If the pointer does not move when voltage is applied in one way and also when reversed it is a capacitor.



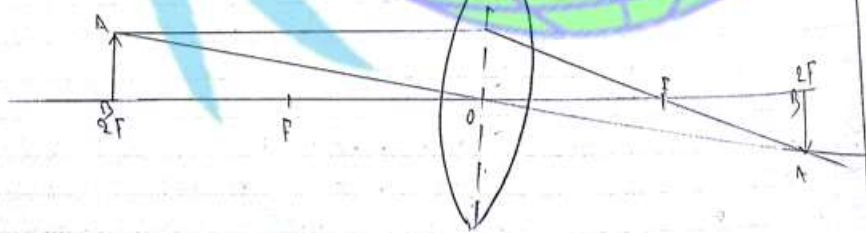
u is At Infinity



u is Beyond 2F



u is At 2F



Expt. No. 05

A

OBJECT  
To Study  
formed  
a Screen  
Concave

APPARATUS  
An opt  
convex  
Concave

THEORY  
From  
 $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$   
When

## ACTIVITY - 5

### OBJECT

To study the nature and the size of the image formed by a convex lens using candle and a screen for different distances of the candle from the lens.

### APPARATUS REQUIRED

An optical bench with three uprights, a convex lens with holder, a burning candle, a card-board screen.

### THEORY

From lens formula,

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

When,

$$u = f$$

$$v = \infty$$

$$u = 2f$$

$$v = 2f$$

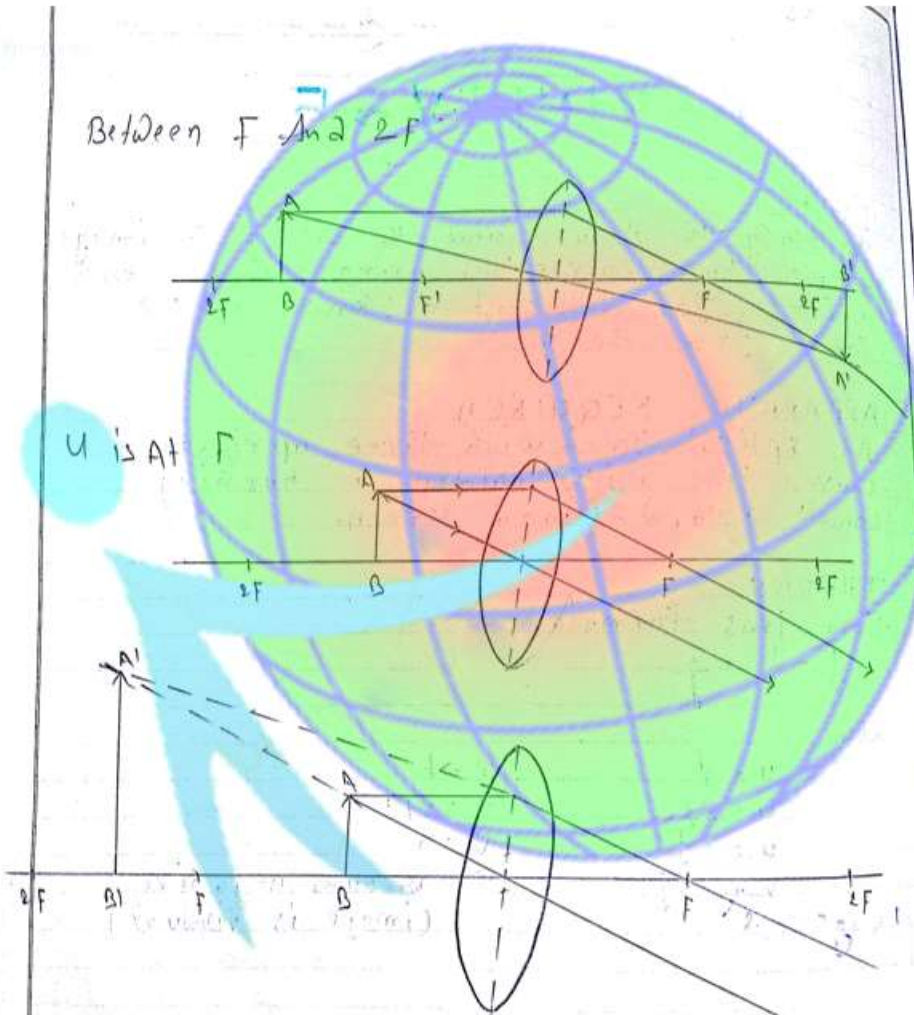
$$u = -f$$

$$v = \infty$$

$$v = -2f$$

$v =$  Becomes negative  
(image is virtual)

Between  $F$  and  $2F$



u is At  $F$

u is Bet<sup>n</sup>  $F$  and Optical Centre

Expt. No. 05

PROCEDURE

- i) The R: determine
- ii) the one made: distance
- iii) The and: target screen
- iv) This
- v) At the the
- vi) At the imo
- Co Thi im



### PROCEDURE

- i) The Rough focal length of convex lens is determined by the usual method.
- ii) The Card board, lens and burning candle are mounted on a single upright and lens is made the central upright with screen at a distance rough focal length is determined.
- iii) The burning candle is put on other side and the three uprights are adjusted. So as to get a sharp image of the candle on screen.
- iv) This image is real, inverted and diminished.
- v) As the candle is moved towards the lens, the screen has to be moved away from the lens to get the sharper image.
- vi) As the candle reaches the focus of the lens the screen may not be able to take its image which is formed at infinity.

### CONCLUSION

This change in position, nature and size of the image is according to the optical predictions.

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### PROCEDURE

- i) The Rough focal length of convex lens is determined by the usual method.
- ii) The Card board, lens and burning candle are mounted on a stand uprightly and lens is made the central upright with screen at a distance rough focal length is determined.
- iii) The burning candle is put on other side and the three uprights are adjusted. So as to get a sharp image of the candle on screen.
- iv) This image is real, inverted and diminished.
- v) As the candle is moved towards the lens, the screen has to be moved away from the lens to get the sharper image.
- vi) As the candle reaches the focus of the lens the screen may not be able to take its image which is formed at infinity.

### CONCLUSION

This change in position, nature and size of the image is according to the optical predictions.

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# ACTIVITY ~ 6

## OBJECT

To study the nature and size of the image formed by a concave mirror using candle and a screen.

## APPARATUS REQUIRED

An optical bench with three upright, a concave mirror with holder, a burning candle, a card holed screen.

## THEORY

From the mirror formula

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

$$u = \infty$$

$$v = -f$$

$$u = -2f$$

$$v = -2f$$

$$u = -f$$

$$v = \infty$$

$$v = f$$

$v$  - becomes positive

(virtual image)

## PROCEDURE

i) The Rough focal length of the concave mirror is determined by the usual method.

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- ii) The mirror, screen and the candle are mounted on upright and the candle and screen are placed on one side of the mirror.
- iii) The upright are so adjusted as to get a sharp image of the burning candle on the screen.
- iv) As candle is moved closer to the mirror the screen has to be moved away to get a sharp image of the candle.
- v) As the candle reaches the focus, the screen may not be able to get the image of candle as it is formed at an infinite distance.

### CONCLUSION

The change in position, nature and size of the image is in accordance to theoretical predictions.

