

The logo features the text 'UDAAN 3.0' in white, bold, sans-serif font on a red, rounded rectangular background. The background has a dotted border and is surrounded by a dashed white line with arrowheads at the top. Below the red box are stylized grey clouds and a yellow sun.

UDAAN 3.0

PHYSICS

ELECTRICITY

Lecture No.- 02

A portrait of a man with dark hair, a mustache, and glasses, wearing a black polo shirt. He is standing with his arms crossed against a yellow background. The text 'ER. RAKSHAK SIR' is written in black on a yellow banner at the bottom right.

ER. RAKSHAK SIR

Today's Targets



1

ELECTRIC CURRENT ✓

2

POTENTIAL & POTENTIAL DIFFERENCE ✓

3

ELECTRICAL CIRCUIT ✓

4

AMMETER, VOLTMETER ✓

5

~~WORKING OF RHEOSTAT ✗~~



ELECTRIC CURRENT

Electric Current is defined as the rate of flow of Charge through a cross-section of a conductor per unit time.

SI Unit of Current : ampere (A)

Que. What constitutes the electric current flowing in a conductor?

Ans. Due to some external agency (Potential Difference), free electrons present in the conductor, flow through the wire, which constitutes the flow of charge as electric current



THE CONCEPT OF VOLTAGE

// Potential Difference

220 V → Domestic Voltage

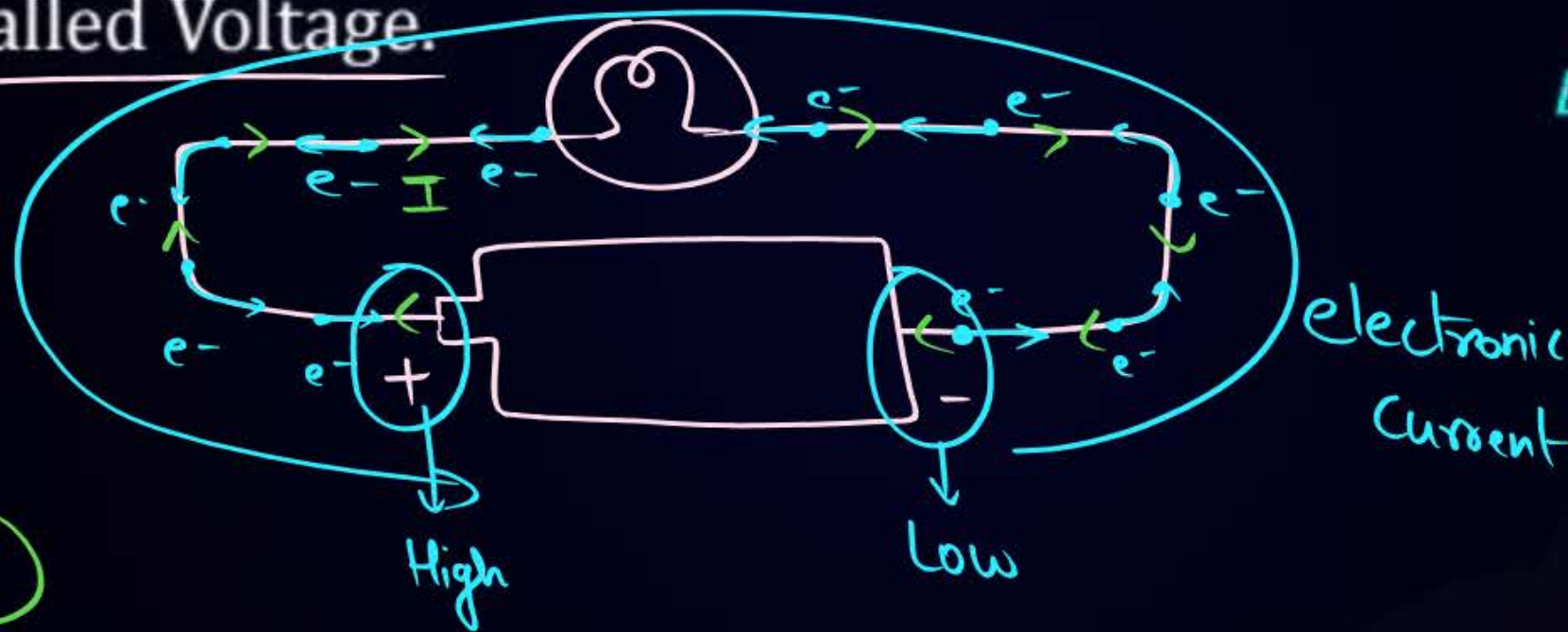
Que. Why does the electric charge flow?

Ans. Electric Charges in a conductor flow due to presence of potential difference across the ends of the conductor, Potential difference, in other words, called Voltage.

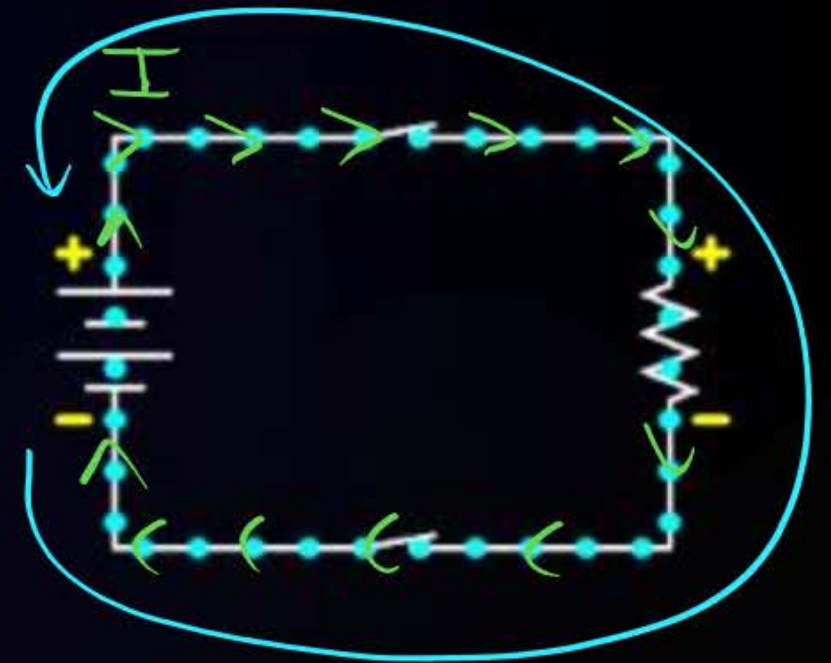
$$I = \frac{Q}{t}$$

Conventional Current -

+ → -



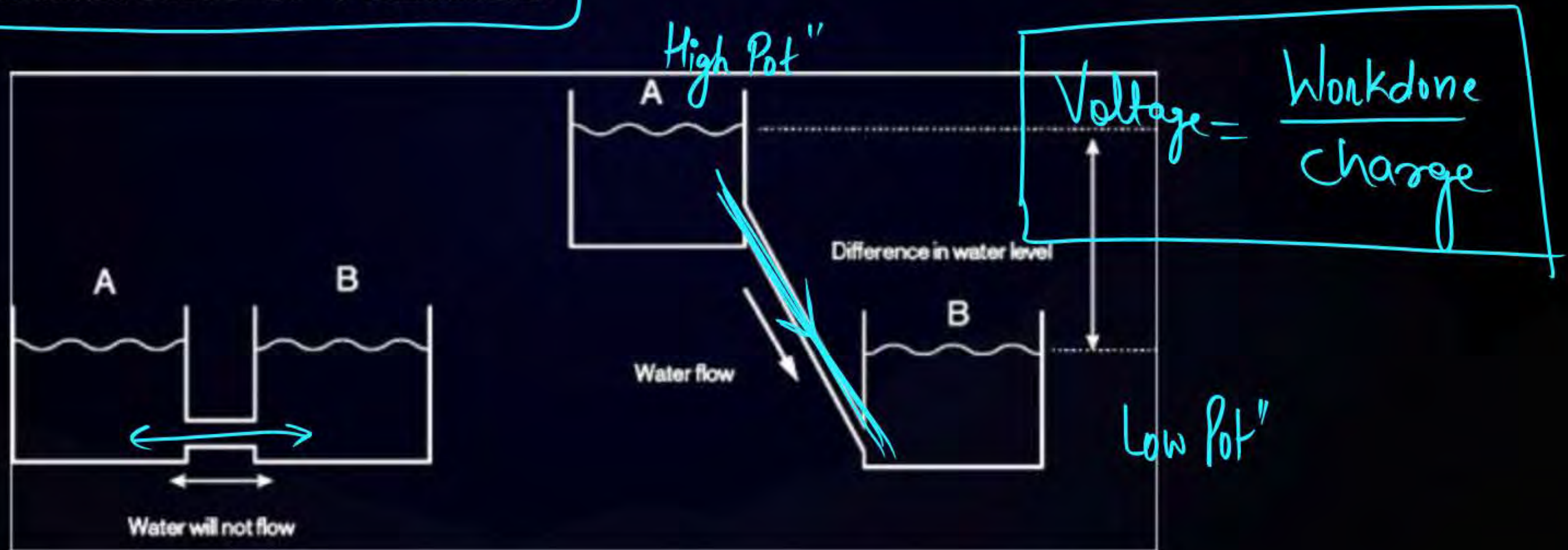
Direction of electron motion



Que. Which entity provides the Potential Difference?

Ans. Cathode and Anode present at the ends of the Battery provides electric energy for the charge to flow in the wire.

2. Potential Difference: The Amount of Work done required on a unit positive charge to move it from one potential point to another potential point, in other words, the work done on a charge by the battery to move it from higher potential to lower potential is called Potential Difference or VOLTAGE





DEFINE ONE VOLT

Define 1 Volt:

When 1 Joule of Work is done on a unit positive charge to move it from one point to another point, then potential difference is said to be 1 volt

Scalar \swarrow

$$V = \frac{W}{Q}$$

$$1V = \frac{1J}{1C}$$

Question



What is the work done required to move a charge of 2 C through a potential difference of 12 V ?

$$V = \frac{W}{Q}$$

$$12 = \frac{W}{2}$$

$$24\text{ J} = W \quad \checkmark$$



ELECTRICAL CIRCUIT



Que. What is an Electric Circuit ?

Ans. A continuous and closed path made up of wires on which an electric current runs is called an electric circuit. An electric circuit consists of electric devices, a source of energy and wires that are connected with the help of a switch.

Open ckt $\rightarrow I = 0$
Closed ckt $\rightarrow I \neq 0$

\rightarrow Variable Resistance

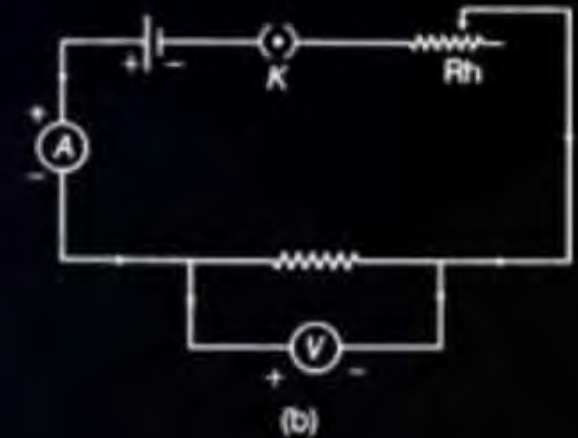
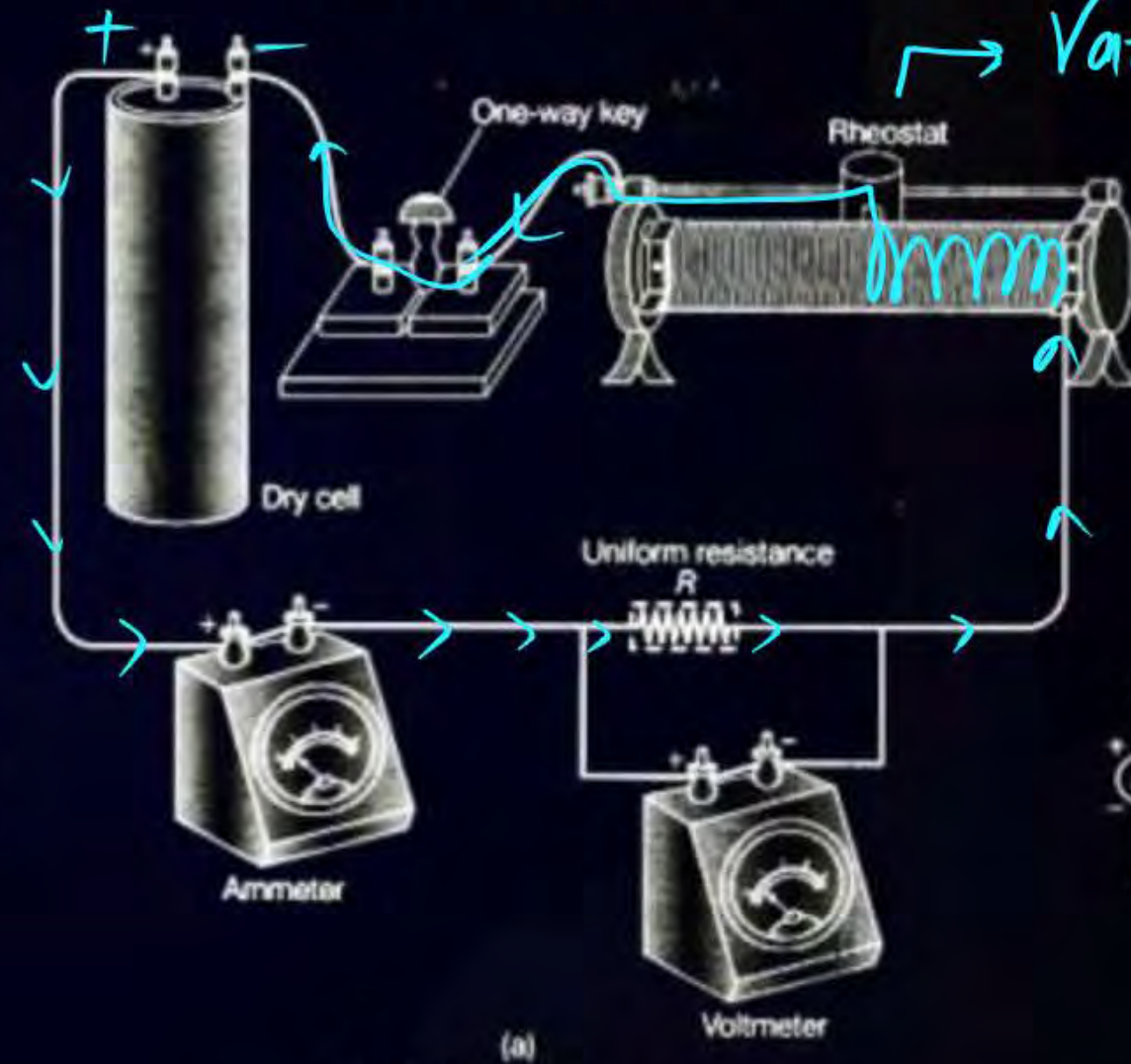


Fig. 1 (a) Arrangement diagram
(b) Circuit diagram



CIRCUIT ELEMENTS



S. No.	Components	Symbols
1	An electric cell	
2	A battery or a combination of cells	
3	Plug key or switch (open)	OFF $I=0$ OPEN ckt.
4	Plug key or switch (closed)	ON $I \neq 0$ Closed ckt.
5	A wire joint	
6	Wires crossing without joining	
7	Electric bulb	
8	A resistor of resistance R	
9	<u>Variable resistance or rheostat</u>	
10	Ammeter	
11	Voltmeter	



CIRCUIT ELEMENTS

Voltage Source



BATTERY
ELIMINATORS



RESISTANCE
BOX



VOLTMETER



AMMETER



PLUG KEY



RHEOSTAT

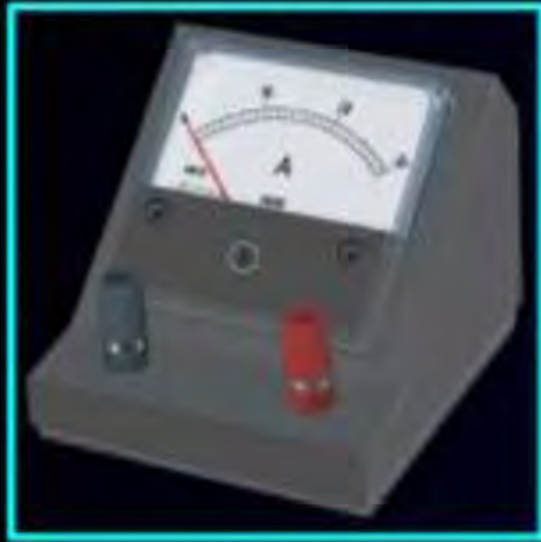


CONNECTING
WIRE

AMMETER, VOLTMETER



Ammeter



- Current measuring device
- Series device
- Its Resistance is near to zero.
 $R \approx 0$

Voltmeter



- Voltage measuring device
- parallel device
- Its resistance is near to infinity
 $R \approx \infty$

Thank
You

