



VIDYA JYOTHI
INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

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Aziznagar Gate, Chilkur Balaji Road, Hyderabad - 500 075.

Department: Electrical & Electronics Engineering

Innovative Teaching Method

Academic Year: 2023-24

Title of Innovative Method/Activity : Demonstration

Name of the Faculty : Dr C N Ravi

Designation : Professor

Course Name : Digital Electronics

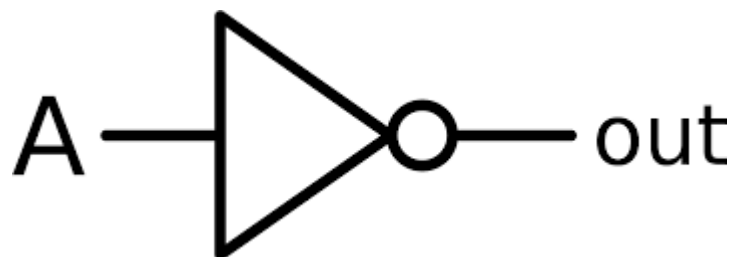
Objective of the method: To kindle interest/enthusiasm by doing the experiment.

Topic covered through activity: NOT & AND gate realization.

Description of the method:

Students are encouraged to learn the concept by doing the experiment. When come to NOT gate realization, a logic gate is a device that acts as a building block for digital circuits. They perform basic logical functions that are fundamental to digital circuits. Most electronic devices we use today will have some form of logic gates in them. For example, logic gates can be used in technologies such as smartphones, tablets or within memory devices.

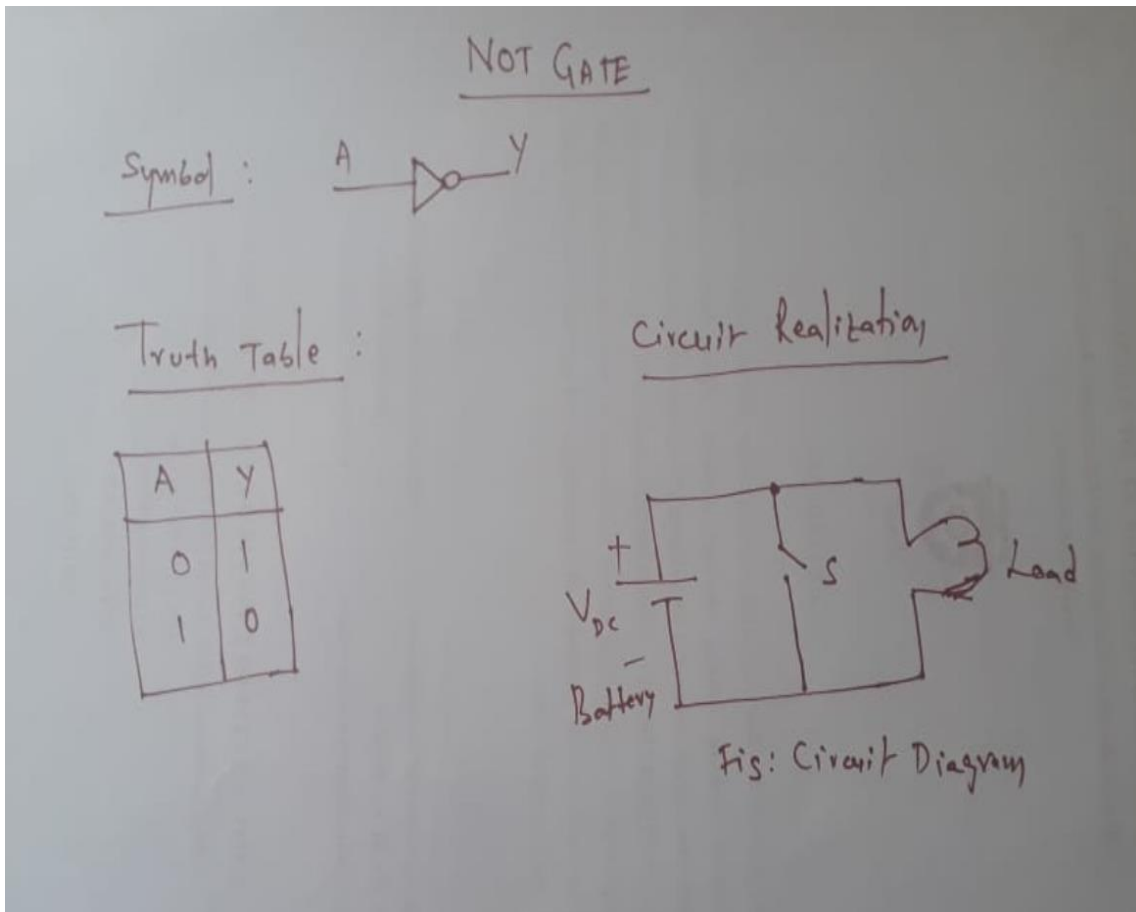
In a circuit, logic gates will make decisions based on a combination of digital signals coming from its inputs. Most logic gates have two inputs and one output. Logic gates are based on Boolean algebra. At any given moment, every terminal is in one of the two binary conditions, *false* or *true*. False represents 0, and true represents 1. Depending on the type of logic gate being used and the combination of inputs, the binary output will differ. A logic gate can be thought of like a light switch, where in one position the output is off -- 0, and in another, it is on -- 1. Logic gates are commonly used in integrated circuits (IC).



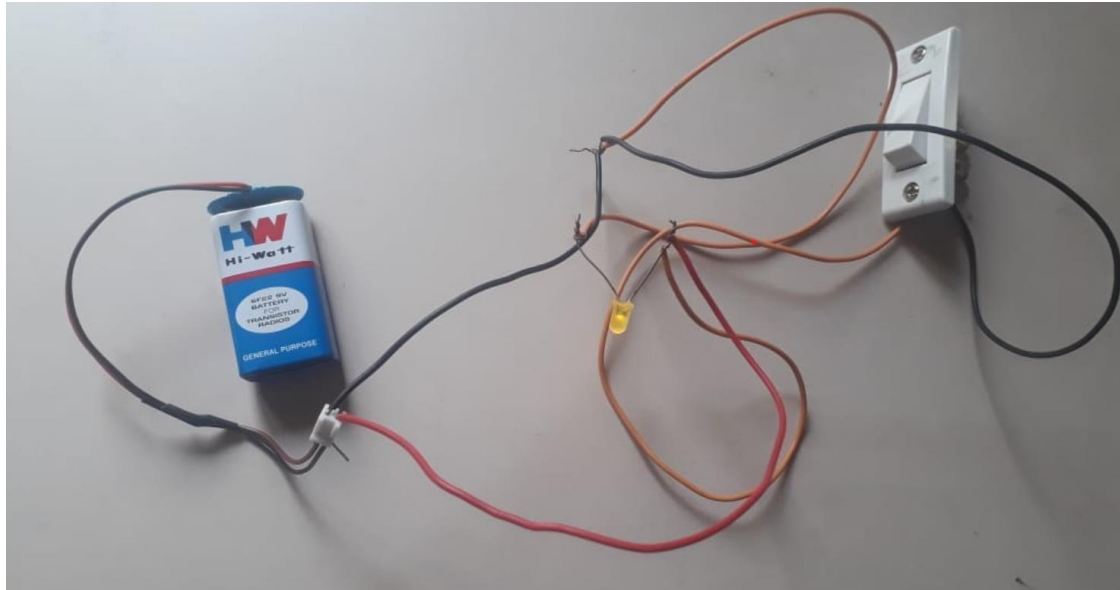
NOT gate

Truth Table:

Input1	Output
0	1
1	0



CASE1: Inputs A=0, Y=1:



CASE2: Inputs A=1, Y=0



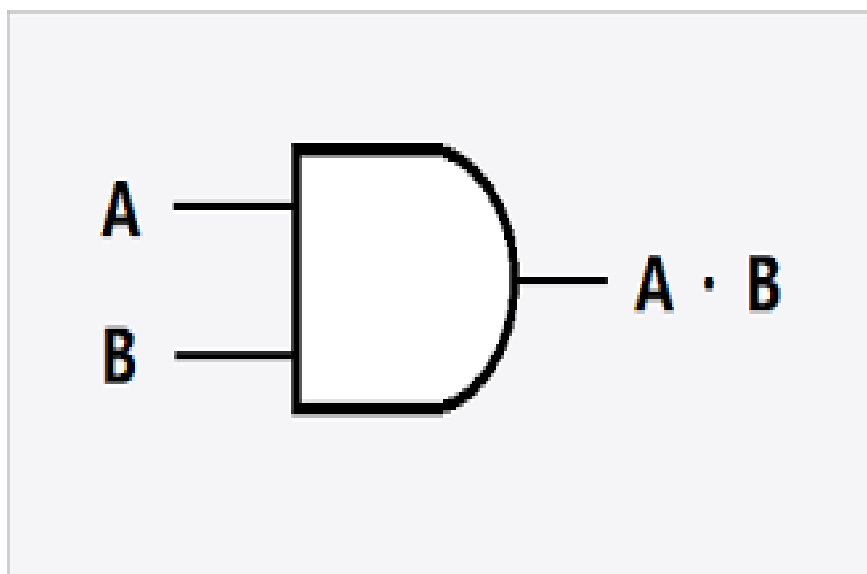
AND gate realization

Description of the method:

Students are encouraged to learn the concept by doing the experiment. When come to AND gate realization, a logic gate is a device that acts as a building block for digital circuits. They perform basic logical functions that are fundamental to digital circuits. Most electronic devices we use today will have some form of logic gates in them. For example, logic gates can be used in technologies such as smartphones, tablets or within memory devices.

In a circuit, logic gates will make decisions based on a combination of digital signals coming from its inputs. Most logic gates have two inputs and one output. Logic gates are based on Boolean algebra. At any given moment, every terminal is in one of the two binary conditions, *false* or *true*. False represents 0, and true represents 1. Depending on the type of logic gate being used and the combination of inputs, the binary output will differ. A logic gate can be thought of like a light switch, where in one position the output is off -- 0, and in another, it is on -- 1. Logic gates are commonly used in integrated circuits (IC).

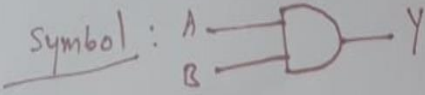
The AND gate gets its name from the fact that it behaves after the fashion of the logical inclusive "AND." The output is "true" if both of the inputs are "true." If anyone inputs are "false," then the output is "false." In other words, for the output to be 1, both inputs are must be 1.



AND gate

Input 1	Input 2	Output
0	0	0
0	1	0
1	0	0
1	1	1

AND GATE

Symbol: 

Truth Table:

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

* Circuit Realization *

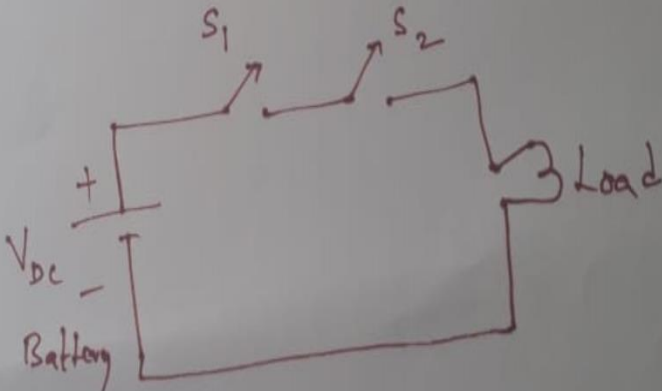


fig: Circuit Diagram.

CASE1: Inputs A=0, B=0, Y=0:



CASE2: Inputs A=0, B=1, Y=0



CASE3: Inputs A=1, B=0, Y=0



CASE4: Inputs A=1, B=1, Y=1



Outcome: The students will be able to identify the electronic devices and will learn how to connect the circuit to understand the working of AND and OR gates

Reflective Critique:

- Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
- Students can able to understand the impact of engineering solution on society.

For review contact: ravicn@vjit.ac.in



Department: Electrical & Electronics Engineering

Innovative Teaching Method

Academic Year: 2023-24

Title of Innovative method/activity	: 1. Hands-On Experimentation , 2. Interactive Simulations, 3. Problem-Solving Through Real-World Applications
Name of the faculty	: Mr. .K. Satish Kumar
Designation	: Assoc Professor
Course Name	: Basic Electrical Engineering

Topic Covered through activity: Ohms Law

1. Hands-On Experimentation

Objective: Allow students to directly observe the relationship between voltage, current, and resistance.

Setup:

Provide simple circuit kits with a power source (battery), resistors, a multimeter, and connecting wires.

Activity:

Students build a simple circuit using one resistor.

Measure and record the voltage (V) across the resistor and the current (I) through the circuit using the multimeter.

Change the resistor and repeat, noting how current changes with resistance.

Calculate resistance (R) $R=V/I$ and compare it with the resistor's labelled value.

Learning Outcome: Students discover the proportional relationship described by Ohm's Law ($V=IR$) through real-world data collection.



2. Interactive Simulations

Objective: Visualize and manipulate circuit parameters dynamically.

Tools: Use online platforms like scilab.

Activity:

Students explore virtual circuits where they can adjust voltage, resistance, and observe changes in current.

Guide them to predict outcomes (e.g., "What happens to the current if we double the voltage?").

Use graphs to plot voltage vs. current for different resistances, reinforcing the concept of proportionality.

Learning Outcome: Students can visualize concepts in a risk-free, engaging environment, and grasp the theoretical aspects more effectively.

3. Problem-Solving Through Real-World Applications

Objective: Link Ohm's Law to practical scenarios.

Activity:

Present real-world problems (e.g., "If a household bulb operates on 120V and consumes 0.5A, what is its resistance?").

Challenge students to design a circuit for specific criteria, like limiting current to a safe value.

Discuss practical implications, such as why appliances have specific resistance values.

Description of method:**Hands-On Experience**

Hands-on experience refers to actively engaging in practical, real-world tasks or simulations to gain knowledge or skills. It involves directly working with tools, devices, or systems rather than merely observing or studying them. Examples include assembling machinery, conducting experiments, or practicing programming on hardware. Hands-on experience is highly valuable in education and training because it bridges theoretical concepts with tangible applications, fostering deeper understanding and skill retention.

Simulation Interface

A simulation interface is a virtual environment designed to replicate real-world systems, processes, or interactions for training, research, or testing purposes. These interfaces often include user-friendly controls, realistic graphics, and interactive elements that mimic actual conditions.

Real-World Interaction Methods

These methods involve engaging directly with physical environments, systems, or individuals to achieve practical outcomes or gather experiential knowledge. Key forms include:

1. **Manual Operations:** Interacting with equipment, tools, or hardware. Examples include repairing engines or building prototypes.
2. **Fieldwork:** Working in natural or industrial environments, such as collecting data in ecological surveys or participating in construction projects.
3. **Augmented Systems:** Using AR/VR tools that overlay virtual instructions or simulations on real-world settings, enhancing the interaction.
4. **Collaborative Activities:** Engaging with teams or stakeholders in real-world projects or problem-solving tasks.

Outcome: students are able to understand the concept clearly and remember for a long time .

Reflective Critique:

- Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
- Students can able to understand the impact of engineering solution on society.

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Department: Electrical & Electronics Engineering

Innovative Teaching Method

Academic Year :2023-24

Title of Innovative method/activity : Never Miss a Class

Name of the faculty : T Parameshwar

Designation : Assoc Professor

Course Name : Electrical Machines

Topic Covered through activity: Constructional features of a 1- \emptyset Transformer

Objective of the method: To make the students learn the topics which the student might have missed during the course

Implementation/Portrayal of method:

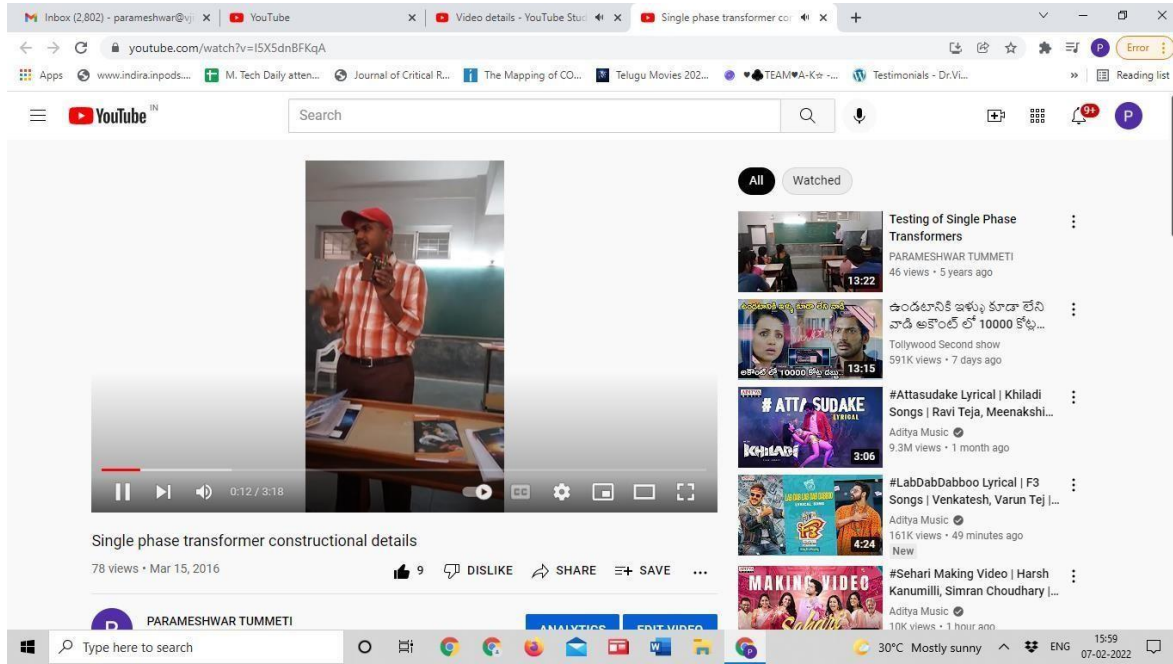
The teacher prepares a video with the course content which is discussed in the class and will share the same on Institute website or in social media platforms like YouTube or WhatsApp which is available for all the students to go through the class.

Benefits of method:

The students who could not attend the class may watch the video and attend the next class, which will make the student not miss any concepts. Even the students who could not understand in the class can watch the video for clarity of the concept.

Description of the method:

In order to implement the same faculty will recording their class work regularly and update the same in social media like YouTube and provide the same link in their constrained class group.



Outcome: students can understand the concept clearly and remember for long time .

Reflective Critique:

- Most of the students are able to recollect the concept quickly whenever asked
- The Pictionary method for direct energy conversion represents a creative and engaging way to understand and visualize complex scientific principles, particularly those involving energy systems.

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You Tube link:

<https://youtu.be/I5X5dnBFKqA>



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Department: Electrical & Electronics Engineering

Innovative Teaching Method

Academic Year: 2023-24

Title of Innovative Method/Activity : Project Based Learning

Name of the Faculty : Mr B Sudhakar Reddy

Designation : Asst Professor

Course Name : Electro Magnetic Fields

Topic covered through activity: IOT based Field strength Calculation

Aim of the method: Whatever the knowledge gained by the students from the subject can be applied to design some project which is useful for the society and for the benefit of student to understand the topic in detail.

Description of the method: In this method students are encouraged to work on the real time problems with engineering solutions. In this approach some no of students are encouraged to work on the problems with solution from the knowledge gained from electromagnetic fields The following is the one output of this approach.

IOT BASED FIELD STRENGTH CALCULATION

Field strength calculation using IOT is an innovative application of internet of things developed to calculate potential energy remotely over the cloud from anywhere in the world. In the proposed project current sensor is used to sense the current and display it on internet using IoT. The system updates the information in every 1 to 2 seconds on the internet using public cloud THINGSPEAK. In the present system, energy load consumption is accessed using Wi-Fi and it will help consumers to avoid unwanted use of electricity. IoT system where a user can monitor energy consumption and pay the bill Online can be made. Also, a system where a user can receive SMS, when he/she crosses threshold of electricity usage slab can be equipped.

Benefits of method: In this method students are exposed to real time problems so that they can understand the topics in better way, which enhances the understanding capability.

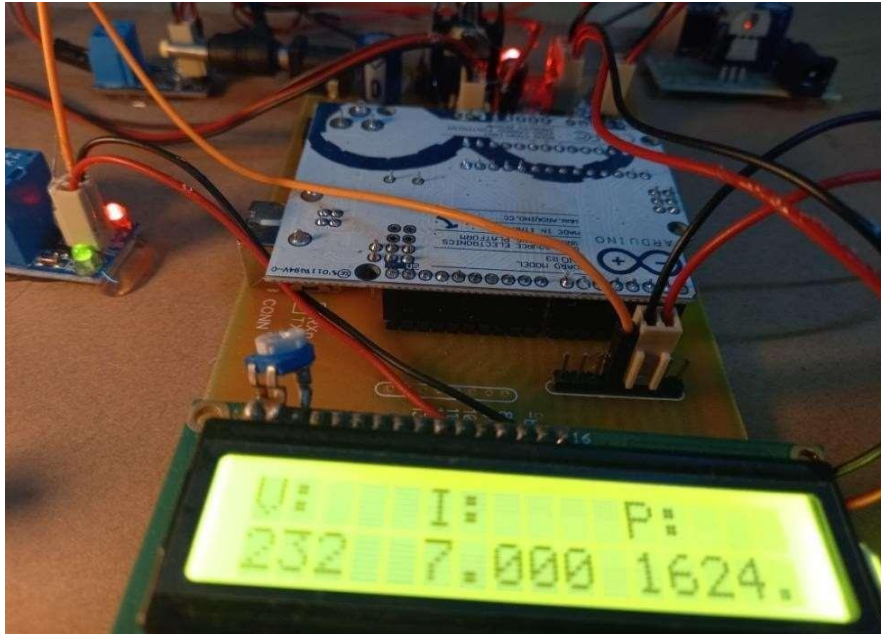


Fig: Display of field strength (Potential difference) for the loads



Fig: Demonstration of project by the students

Reflective Critique:

- Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
- Also they can able to visualize the electrostatic field, therefore they easily understand the concept

Outcome: It helps to involve students enthusiastically during the sessions.

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Department: Electrical & Electronics Engineering

Innovative Teaching Method

Academic Year: 2023-24

Title of Innovative Method/Activity : Socio Constructive Approach

Name of the Faculty : K SWAPNA

Designation : Assistant Professor

Course Name : Basic Electrical Engineering

Aim of the method: Better understanding of a topic by students.

Topic covered through activity: FUSE & CIRCUIT BREAKER

Social constructivist perspectives focus on the interdependence of students in the co-construction of knowledge

Description of the method: The teacher plays a video related to a topic and poses questions on the topic and the students answer the same.

Benefits of Method: They will be able to recollect and reproduce the topics as they have visualized the topics.

VEIDO PLAYED: FUSE & CIRCUIT BREAKER

LINK: <https://youtu.be/BLIYsRwKrE>

QUESTIONS

1. What is electric fuse?

Ans) In electronics and electrical engineering, a fuse is an electrical safety device that operates to provide overcurrent protection of an electrical circuit.

2. How it works?

Ans) Fuse essential component is a metal wire or strip that melts when too much current flows through it, thereby stopping or interrupting the current.

3. What are the advantages of electric fuse?

Ans) Fuse is cheapest type of protection in an electrical circuit. The fuse needs zero maintenance.

4. What are the disadvantages of electric fuse?

Ans) It is not suitable for overload, at that time fuse blow off replacing of fuse takes time. The protection of fuse is not reliable.

5. What is MCB?

Ans) MCB (Miniature Circuit Breaker) are electromechanical devices which are used to protect an electrical circuit from an overcurrent. It can be reclosed without any hand-operated restoration. MCB is used as an option to the fuse switch in most of the circuits Low breaking capacity.

6. What is the main difference between fuse and circuit breaker?

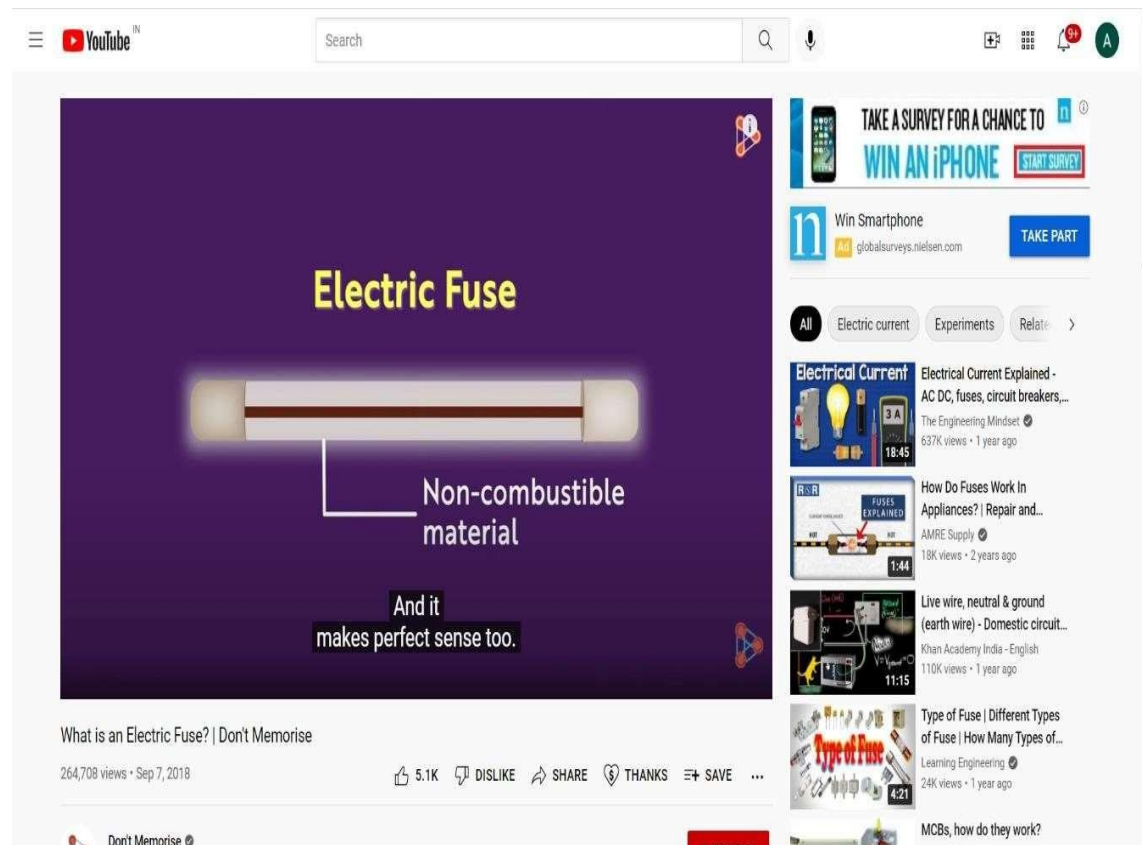
Ans) The main difference between the two is that a circuit breaker can be reset and used over and over again while a fuse is a one-shot deal that has to be replaced.

7. Name the material of a fuse wire.

Ans) Fuse wire is made of alloy of lead and tin having low melting point of 200°C .

8. What is the working principle of fuse?

Ans) Melting of internal conductor due to heat generated by excessive current flow.



The image shows a screenshot of a YouTube video player. The video title is "What is an Electric Fuse? | Don't Memorise". The video content features a purple background with the text "Electric Fuse" in yellow. Below the text is a diagram of a fuse wire, which is a thin brown line between two white cylindrical terminals. A white bracket points to the fuse wire with the text "Non-combustible material". Below the diagram, a black box contains the text "And it makes perfect sense too." in white. The video player interface includes a search bar at the top, a video player with a play button, and a list of related videos on the right side. The video has 264,708 views and was uploaded on Sep 7, 2018. The channel name is "Don't Memorise".

Simplified Circuit

Now there is one obvious disadvantage of electric fuse that you must have

What is an Electric Fuse? | Don't Memorise
264,708 views • Sep 7, 2018

Miniature Circuit Breakers (MCB)

is back to normal!

What is an Electric Fuse? | Don't Memorise
264,708 views • Sep 7, 2018

Outcome: This activity helps the students to remember the topics, circuits, and also concepts with means of video examples and animation.

Reflective Critique:

- Students understood the concept which was reflected in their answers to the questions I have asked during the discussion session.
- Also they can able to visualize the electrostatic field, therefore they easily understand the concept.

For review contact: swapnak@vjit.ac.in