

# **BASIC AC CIRCUITS**

## **CHALLENGE TASK**

### **Objective:**

To study the characteristics of purely resistive, purely inductive and purely capacitive circuits using multisim

**Name:**

**Matrix No. :**

**Class :**

# Basic AC Circuits

## Overview :

Direct current (DC) and alternating current (AC) are the two types of electricity. DC circuit and AC circuit show the structure of the respective circuit systems.

The main components of AC circuits are resistors, capacitors, and inductors.

All these passive electrical elements have one property in common; they restrict electric current in a circuit coil but in completely different ways.

The voltages and currents are marked by direction and magnitude in an AC circuit. The alternating values may or may not be in phase with each other, relying on the different variables of the system like capacitance, inductance and resistance. The sinusoidal alternating values are current and voltage, which differ by cohering to the sine of angle  $\theta$ .

## Challenge:

Create simple electrical circuits for 3 different circuits with same supply voltage of 10V, 50Hz using multisim at <https://www.multisim.com/>. Purely resistor circuit using 330 ohm resistor, purely inductor circuit using 0.1H and purely capacitive circuit using 4.7uF. Experiment with different circuit configurations to understand the waveform of voltage and current for purely resistive, purely inductive and purely capacitive.

# Purely Resistive Circuit

Apparatus:

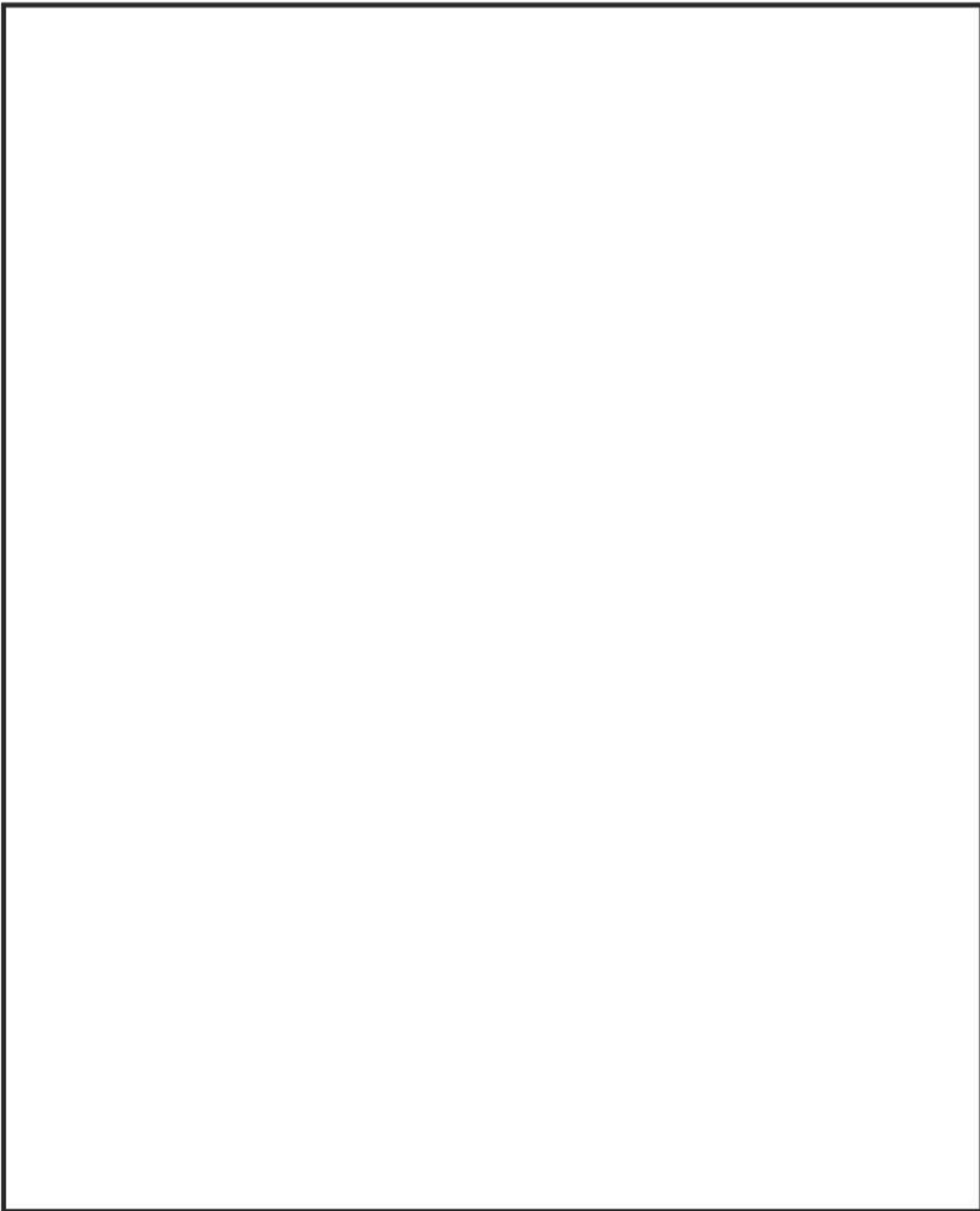
A large empty rectangular box for drawing the apparatus of a purely resistive circuit.

Labelled Circuit:

A large empty rectangular box for drawing a labelled circuit diagram.

# Purely Resistive Circuit

Labelled Waveform:



# Purely Inductive Circuit

Apparatus:

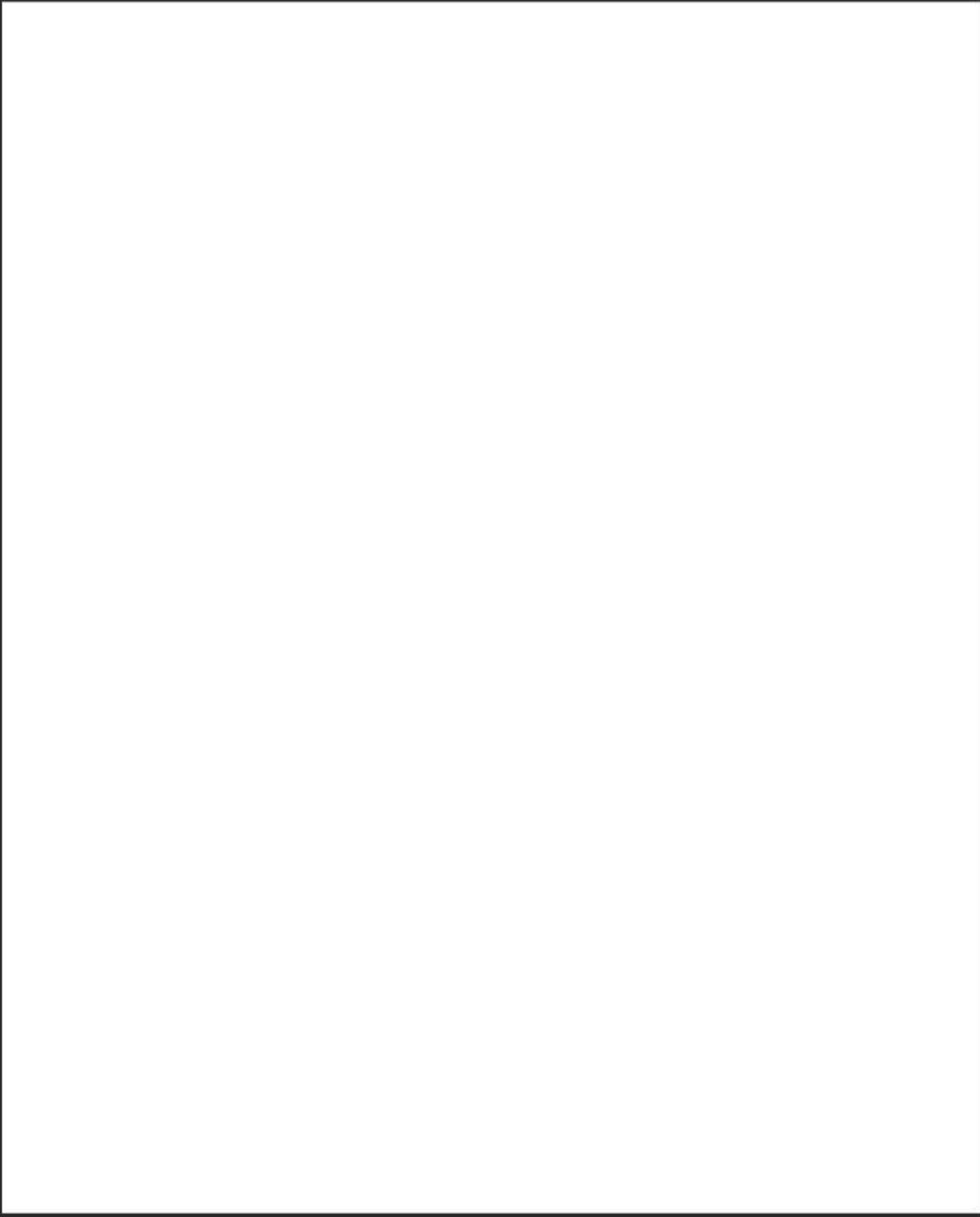
A large empty rectangular box for drawing the apparatus of a purely inductive circuit.

Labelled Circuit:

A large empty rectangular box for drawing a labelled circuit diagram.

# Purely Inductive Circuit

Labelled Waveform:



# Purely Capacitive Circuit

Apparatus:

A large empty rectangular box with a black border, intended for drawing the apparatus of a purely capacitive circuit.

Labelled Circuit:

A large empty rectangular box with a black border, intended for drawing a circuit diagram with labels.

# Purely Capacitive Circuit

Labelled Waveform:

