VISVESARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI, KARNATAKA-590014

A MINI PROJECT REPORT

ON

"METAL DETECTOR"

Submitted in Partial fulfilment of the requirement of CIE in ADE (18CS33) for the award of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by:

AHMAD UVAIS	**4PA20CS016**
MOHAMMED THANSEER	**4PA20CS067**
ABDUL BASEETH A M	**4PA20CS003**
MUHAMMED ATHUF	**4PA20CS076**

P. A. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

NADUPADAVU MANGALORE-574153, KARNATAKA

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P. A. COLLEGE OF ENGINEERING

(Affiliated to Visvesvaraya Technological University and Approved by AICTE)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

Certified that the project work entitled **"Metal Detector"** is a bonafide work carried out by **Mr.AHMED UVAIS USN: 4PA20CS016, Mr.MOHAMMED THANSEER USN: 4PA20CS067,Mr.ABDUL BASEETH A M USN:4PA20CS003, Mr.MUHAMMED ATHUF USN: 4PA20CS076** in partial fulfillment of CIE in ADE (18CS33) for the award of degree of "**BACHELOR OF ENGINEERING**" in **COMPUTER SCIENCE AND ENGINEERING** of **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM** during the year 2020-2021.

Prof Saifuddeen kudroli **Project Guide**	**Dr. Sharmila Kumari** **Head of the Department**

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Chapter 1

INTRODUCTION

1.1 INTRODUCTION:

A metal detector is an instrument that detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal object buried underground. They often consist of a handheld unit with a sensor probe which can be swept over the ground or other objects. If the sensor comes near a piece of metal this is indicated by a changing tone in earphones, or a needle moving on an indicator. Usually, the device gives some indication of distance; the closer the metal is, the higher the tone in the earphone or the higher the needle goes. Another common type are stationary "walk through" metal detectors used at access points in prisons, courthouses, and airports to detect concealed metal weapons on a person's body.

1.2 ABSTRACT:

Metal detectors are extensively used to find undesirable metal objects in processed food. In such a typical metal detector, the coils are coaxially arranged with the transmitting coil in the center and two receiving coils on the sides. The receiving coils are connected to a differential amplifier. When the magnetic field generated in the transmitting coil is disturbed by metal objects, the amplitude and phase of the output voltage of the differential amplifier change, and, thus, the existence of foreign metal pieces is detected. The relationship between the amplitude and phase of the output and the electromagnetic properties of the metal objects, however, has only been discussed experimentally so far.

Chapter 2

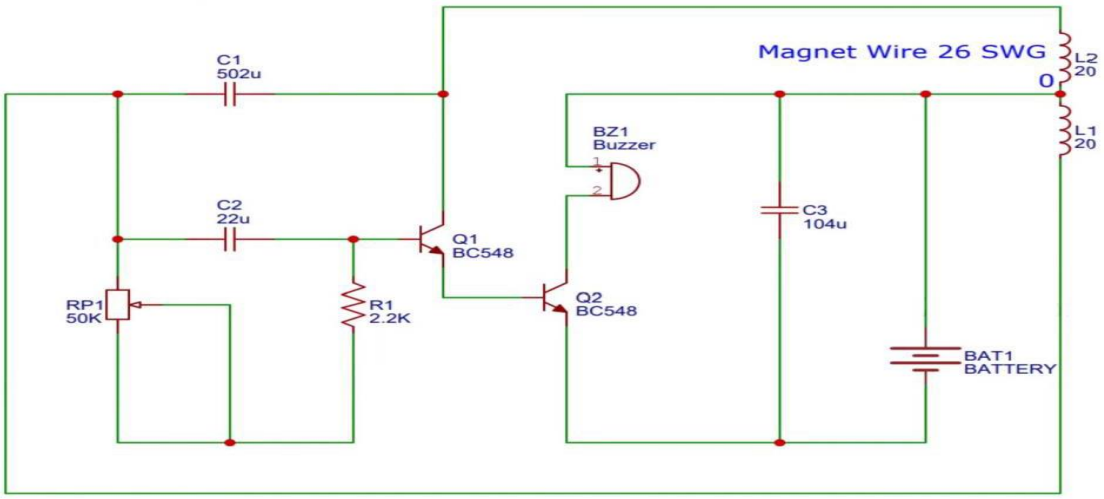
COMPONENTS REQUIRED:

Sl. No	Components	quantity
1	BC548 NPN 30V, 0.1A Transistor	2
2	22pF Capacitor	1
3	2.2k Ω Resistor	1
4	470pF Capacitor	1
5	Potentiometer	1
6	5V Buzzer	1
7	0.1uF Capacitor	1
8	Copper wire	As required
9	3V to 5V Battery	1

Chapter 3

METHODOLOGY:

3.1 Block diagram:



3.2 Procedure:

1. Before making the connections, check the components using multimeter.
2. Make the connections as shown in figure.
3. Switch on the power supply.
4. Observe the metal detection by placing on the objects.

3.3 Working:

The operation of metal detectors is based upon the principles of electromagnetic induction. The eddy currents induce their own magnetic field, shown in red, which generates an opposite current in the coil, which induces a signal indicating the presence of metal.

Chapter 4

APPLICATION:

- Detecting land mines.
- Detection of weapons such as knives and guns (especially in airport security).
- Geophysical prospecting.
- Archaeology and treasure hunting.
- Detecting foil wrapped drugs.
- Precious metals associated with jewellery or antiques theft.

Chapter 5

CONCLUSION:

• Overall, we successfully reached our goal and created a circuit that has good potential applications for the real world.

• The metal detector circuit is already used for different kinds of things.

• One example of an important use for a metal detector is for airport security.

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This project is completed successfully. On placing the metal near sensor (Inductor) sound is produced and sound is stopped when metal is removed.