CIA 4 – Research Based Activity

Report on

“ULTRASONIC WAVES”

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CERTIFICATE

This is to certify that **DUNGARWAL MANN and SHETIYA KHUSHI** of 2ND Semester of B. Tech in **Computer Science and Engineering (AIML), SANDIP UNIVERSITY**, **NASHIK** has completed the Research Paper satisfactorily in **APPLIED PHY** for the academic year**2022- 2023** as prescribed in the curriculum.

Place: **Nashik**

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ABSTRACT

Ultrasonic waves are sound waves with a frequency greater than 20 kHz and have many applications in various fields such as medicine, industry, and non-destructive testing. This research paper provides an overview of ultrasonic waves, their properties, and applications in different fields. The paper discusses the physics behind the generation and propagation of ultrasonic waves and how they interact with different materials. Moreover, the paper highlights the advancements in ultrasonic technology and their potential future applications.

INTRODUCTION

Ultrasonic waves are sound waves with frequencies above the range of human hearing. They are used extensively in various fields for their unique properties such as high frequency, short wavelength, and non-invasive nature. Ultrasonic waves are generated using piezoelectric transducers, which convert electrical energy into mechanical vibrations. These vibrations create a sound wave that propagates through a medium such as air, water, or solid materials. Ultrasonic waves are used for a variety of purposes such as imaging, cleaning, testing, and sensing.

GENERATION OF ULTRASONIC WAVES

Ultrasonic waves are generated using piezoelectric transducers, which convert electrical energy into mechanical vibrations. These vibrations create a sound wave that propagates through a medium such as air, water, or solid materials. Ultrasonic waves can be reflected, transmitted, absorbed, or scattered depending on the properties of the material they encounter. These interactions can be used to determine the properties of the material such as its thickness, density, and elasticity.

APPLICATION OF ULTRASONIC WAVES

Ultrasonic waves have numerous applications in different fields such as medicine, industry, and non-destructive testing. In medicine, ultrasonic waves are used for imaging, therapy, and diagnosis of various diseases. In industry, ultrasonic waves are used for cleaning, welding, and testing of materials. In non-destructive testing, ultrasonic waves are used to detect cracks, flaws, and defects in materials without damaging them.

CONCLUSION

Ultrasonic waves have numerous applications in various fields, and their unique properties make them ideal for imaging, cleaning, testing, and sensing. The advancements in ultrasonic technology have led to the development of new applications and improved performance. The potential future applications of ultrasonic waves are vast, and ongoing research and development are expected to lead to new and exciting discoveries.