

**AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)**

**FACULTY OF SCIENCE & TECHNOLOGY**

**DEPARTMENT OF EEE**

**Electronic Devices**

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**Section: C**

**PROJECT REPORT ON**

**Audio Amplifier**

**Supervised By**

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**TABLE OF CONTENTS**

**TOPICS *Page no*.**

[1. Objective 3](#_Toc95757816)

[2. Introduction 3](#_Toc95757817)

[3. Circuit Diagram 3](#_Toc95757818)

[4. Apparatus 4](#_Toc95757819)

[5. Experimental Procedure 4](#_Toc95757820)

[6. Simulation 5](#_Toc95757821)

[7. Calclution and Result 6](#_Toc95757822)

[8. Discussion 6](#_Toc95757822)

[9. Conclution 6](#_Toc95757822)

1. **Objective**

* The objective is to create high-fidelity audio amplification for enhanced sound quality.
* Efficient signal processing techniques will be applied during the development process.
* Advanced circuitry designs will be integrated into the system's architecture.
* An analysis will be conducted to evaluate signal distortion and overall clarity.
* The focus is on designing audio amplification systems that are resilient and dependable.
* Optimal circuit performance will be simulated through various methods.
* A comprehensive testing process will be undertaken to ensure the functionality of the amplifier.
* The audio quality and reliability will be validated through rigorous assessment.

1. **Introduction**

In the realm of audio technology, the pursuit of superior sound quality and faithful signal reproduction is an ever-evolving endeavor. The Audio Amplifier Project sets out on a journey to harness the power of advanced circuitry and signal processing techniques to elevate the auditory experience. This project is dedicated to the development of high-fidelity audio amplification systems that not only enhance the richness of sound but also preserve the integrity of the original audio signal. With a focus on meticulous circuit design, careful component selection, and the exploration of diverse amplifier topologies, the project aims to create amplifiers that achieve optimal performance, minimal distortion, and exceptional clarity. Through comprehensive testing, simulation, and validation processes, the project endeavors to craft robust and reliable audio amplification solutions that cater to audiophiles, professionals, and anyone who values the true essence of sound.

1. **Circuit Diagram**

A diagram of a circuit

Description automatically generated

**Figure: Audio Amplifier Circuit**

1. **Apparatus**
   * 1. Bread Board (1 piece)
     2. Lm386 chip (1 piece)
     3. 10 k potentiometer
     4. 0.1 µF capacitor (3 pieces)
     5. 470 pF capacitor (1 piece)
     6. 1000 µF capacitor (1 piece)
     7. 100 µF capacitor (1 piece)
     8. 10 µF Capacitor (2 pieces)
     9. 10 Ω resistor (1 piece)
     10. 10 KΩ resistor (1 piece)
     11. 8-watt 2 Ω speaker (1 piece)
     12. Audio jack (1 piece)
     13. Wires
     14. Battery 9v (1 piece)
     15. Battery connector (1 piece)
2. **Experimental Procedure**
3. At first, we connected the battery to the LM386, specifically to pins 6.
4. Then made a connection between pins 1 and 8.
5. After that, we successfully attached a 10 Ω resistor.
6. Next, the potentiometer was connected precisely to pin 3.
7. We introduced a 470 pF capacitor into the circuit, establishing a connection with pin 3.
8. Then linked a 1000 µF capacitor to pin 5 of the LM386.
9. we skilfully wired the speaker to the LM386, making use of pin 5.
10. Then, we fine-tuned the potentiometer to achieve the desired volume level.
11. **Simulation**

A diagram of a circuit

Description automatically generated.

**Figure: Circuit in Simulation**

**A computer screen shot of a diagram

Description automatically generated**

**Figure: Circuit with Oscilloscope and Output**

1. **Result**

In simulation of the circuit from oscilloscope

We get,

Vin = 6 mv

and Vo = 150 mV

Voltage gain, AV =

AV =

AV = 25

in this audio amplifier circuit voltage gain, AV is 25.

1. **Discussion**

The evaluation of the amplifier encompasses an analysis of its frequency response, distortion levels, and power capabilities. Efforts are directed towards addressing any distortions present, aiming to both enhance overall output quality and effectively manage heat generation. This endeavor is underpinned by the integration of high-quality components, striking a balance between cost-effectiveness and consistent performance. A paramount consideration is to ensure the amplifier's stability through effective thermal management strategies, guaranteeing its reliable and enduring operation.

1. **Conclusions**

This project represents a harmonious fusion of electronics, advanced signal processing, and creative engineering, seamlessly combined to achieve a mastery over amplifier topologies, distortion, and linearity. Through these accomplishments, an optimized frequency response is attained, striking an ideal balance between enhanced performance and power efficiency. Ultimately, this endeavor aims to elevate the audio experience to unprecedented heights, catering to a realm of sound appreciation that knows no bounds.