Assignment 2: Theory of Rankine and Brayton Cycles

Objective

The objective of this assignment is to understand the theoretical principles of the Rankine cycle and the Brayton cycle, which are fundamental thermodynamic cycles used in steam power plants and gas turbine power plants, respectively.

Assignment Description

You are required to prepare a short report explaining the **theory** of the Rankine cycle and the Brayton cycle. The report should focus on the ideal cycles and their thermodynamic processes.

Report Guidelines

The report must include the following sections:

1. Introduction

- Importance of thermodynamic power cycles in energy conversion.
- Brief overview of Rankine and Brayton cycles.

2. Rankine Cycle

- Description of the ideal Rankine cycle.
- Explanation of the four basic processes.
- Major components: boiler, turbine, condenser, and pump.
- Temperature–entropy (T–s) diagram.
- Expression for thermal efficiency.

3. Brayton Cycle

- Description of the ideal Brayton cycle.
- Explanation of the four basic processes.
- Major components: compressor, combustion chamber, and turbine.
- Temperature–entropy (T–s) diagram.
- Expression for thermal efficiency.

4. Comparison

- Key differences between Rankine and Brayton cycles.
- Typical applications of each cycle.

5. Conclusion

Summarize the key theoretical insights gained from studying both cycles.

Submission Guidelines

- Length: 5-6 pages
- Format: PDF
- Diagrams must be neat and properly labeled
- References must be included