Module 14: Assignment
Battery Fundamentals and BMS

Problem Statement:

As an engineer working on a project involving the design and analysis of a rechargeable battery system for a portable electronic device, your task is to calculate various parameters related to the battery's performance and characteristics to ensure its efficiency and reliability.

Tasks to be Performed:

1. Self-discharge Rate:

Given:
- Total capacity of the battery = 1000 mAh
- Storage time = 30 days

Calculate the self-discharge rate.

2. Battery Capacity:

Given:
-Discharge duration = 5 hours
- Discharge current = 200 mA

Calculate the battery capacity.

3. State of Charge (SoC):

Given:
- Current energy = 500 mAh
- Maximum energy = 1000 mAh

Calculate the state of charge (SoC).

4. Depth of Discharge (DoD):

Given:
- Discharge current = 100 mA
- Discharge duration = 3 hours
- Total battery capacity = 2000 mAh

Calculate the depth of discharge (DoD).

5. Energy Density:

Given:
- The voltage of the battery = 3.7 V
- Capacity of the battery = 1500 mWh
- Weight of the battery = 50 g

Calculate the energy density.