

Course outline

How does an NPTEL online course work?

Module 1 - Overview of Electric Vehicles in India

Module 2 - Vehicle Dynamics

Module 2 and 3 - Vehicle Dynamics and EV Subsystems

Module 4 - Storage for EVs

Module 4 - Storage for EVs (contd)

● Lecture 27 - SoH and SoC estimation and Self Discharge - Part 1

● Lecture 28 - SoH and SoC estimation and Self Discharge - Part 2

● Lecture 29 - Battery Pack Development - Part 1

● Lecture 30 - Battery Pack Development - Part 2

● Lecture 31 - Computation of Effective cost of battery - Part 1

● Lecture 32 - Computation of Effective cost of battery - Part 2

● Lecture 33 - Charging Batteries

○ Quiz: Week 5: Assignment 1

○ Quiz: Week 5: Assignment 2

○ Quiz: Week 5: Assignment 3

○ Quiz: Week 5: Assignment 4

● Week 5 - Lecture notes

● Week 5 - Feedback form: Electric Vehicles and Renewable Energy

● Week 5: Solutions

Module 5 - Fundamentals of battery pack design

Module 5 and 6 - Battery Pack Design, Motors and Controllers

Module 6 - EV Motors and Controllers

Module 7&8 - Battery Charging and Swapping, Analytics

Module 9: Renewable Energy - Introduction

Module 10: Renewable Energy - Solar and Wind Energy

Module 11: Renewable Energy

Live Session

DOWNLOAD VIDEOS

Energy - Solar and Wind Energy

Module 11: Renewable Energy

Live Session

DOWNLOAD VIDEOS

Week 5: Assignment 1

The due date for submitting this assignment has passed.

Due on 2021-09-01, 23:59 IST.

As per our records you have not submitted this assignment.

A battery has an initial rated capacity of 10 kWh at 48V. Battery is charged using standard charging conditions. Coulomb counting indicates a charge of 30Ah has flown in before termination of charge.

If SoH refers to capacity fade, then

1) What will be the the % SOC change when SoH is 90%? (Correct up to 1 decimal place)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 15.9,16.1

0.5 points

2) What will be the the % SOC change when SoH is 85%? (Correct up to 1 decimal place)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 16.9,17

0.5 points

3) If SoH is 1% wrong, how much (%) accuracy will be lost in SoC change.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.9,1.1

1 point

Identify whether the below statements are True or False

4) A Battery when charged at 3C vis-à-vis 1C, the cells reach peak voltage at lower SoC.

0.5 points

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

5) Once one reaches the peak voltage of a cell (say 4.2V), the battery can not be charged further.

0.5 points

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

6) Discharging of a NMC Li Ion cell at high rate could bring down its terminal voltage to 3.3 V (or lower cutoff voltage) even when SoC is higher than 20%.

0.5 points

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

7) SoC of a Li-Ion Batteries a linear function of voltage.

0.5 points

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

A Li Ion cell when charged fully (to 4.2V) has an Internal resistance of 20 mΩ at Beginning of Life (BoL). At its End of Life (EoL) the cell suffers a 150% rise in its internal resistance at full charge.

8) Determine the max peak instantaneous current (in A) the cell can support at 4.2V when at its BoL

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

A Li Ion cell when charged fully (to 4.2V) has an Internal resistance of 20 mΩ at Beginning of Life (BoL). At its End of Life (EoL) the cell suffers a 150% rise in its internal resistance at full charge.

8) Determine the max peak instantaneous current (in A) the cell can support at 4.2V when at its BoL

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 205,215

0.5 points

9) Determine the max peak instantaneous current(in A) the cell can support at 4.2V when at its EoL

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 80,90

0.5 points

10) A 3.65V, 15Ah (rated capacity) li Ion cell, with 88% SoH is charged fully (0 to 100% SoC) and is being used to power a load demanding continuous current of 1C. How long (time in minutes) can the cell power the load?