

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)

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

- Lecture 73 - EV Charger Introduction
- Lecture 74 - Charger Paramaters and Types
- Lecture 75 - Slow/Fast chargers and Swapping
- Lecture 76 - Swapping
- Lecture 77 - Standardization and on board chargers
- Lecture 78 - Public chargers
- Lecture 79 - Public charger economics in Indian Context
- Lecture 80 - Bulk Chargers, Swapping stations and data analytics
- Week 9: Lecture notes
- Quiz: Week 9: Assignment 1
- Quiz: Week 9: Assignment 2
- Quiz: Week 9: Assignment 3
- Quiz: Week 9: Assignment 4
- Quiz: Week 9: Assignment 5
- Week 9: Feedback form: Electric Vehicles and Renewable Energy
- Week 9: Solutions

Module 9: Renewable Energy - Introduction

Module 10: Renewable Energy - Solar and Wind Energy

Module 11: Renewable Energy

Live Session

DOWNLOAD VIDEOS

Week 9: Assignment 1

The due date for submitting this assignment has passed.

Due on 2021-09-29, 23:59 IST.

As per our records you have not submitted this assignment.

For a full battery-pack of 48V, calculate actual heat dissipated (in W), assuming the battery is discharged at 1C for different cells given below. Assume 1P13S pack configuration

- 1) Calculate actual heat dissipated (in W) for **Prismatic Cells (3.7V, Capacity = 15Ah, IR = 6mΩ)**

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 16, 19

1 point

- 2) Calculate actual heat dissipated (in W) for **Cylindrical Cells(3.7V, Capacity = 4Ah, IR = 35mΩ)**

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 6, 8

1 point

- 3) Calculate actual heat dissipated (in W) for **Pouch Cells(3.7V, Capacity = 50Ah, IR = 1.5mΩ)**

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 45, 50

1 point

Calculate heat dissipation (in kW) for a 50 kWh battery at 350V for the three kind of cells, again assuming 1C discharge.

- 4) Calculate heat dissipation (in kW) for **Prismatic Cells**(3.7V, Capacity = 15Ah, IR = 6mΩ)

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 1.15, 1.42

1 point

- 5) Calculate heat dissipation (in kW) for **Cylindrical Cells**(3.7V, Capacity = 4Ah, IR = 35mΩ)

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 1.85, 2

1 point

- 6) Calculate heat dissipation (in kW) for **Pouch Cells**(3.7V, Capacity = 50Ah, IR = 1.5mΩ)

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 1, 1.1

1 point

A vehicle has a new 30 kWh battery. Its DoD is 0.9 DoD (with 5% at bottom and 5% at top). It consumes 150 Wh/km. What would be the range (in km) that the vehicle can give:

- 7) If it is charged fully at rate of 0.5C

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Numeric) 180

1 point

- 8) If it is charged fully at rate of 2.5C

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Numeric) 180

1 point

There is a 20 kW charger with output voltage that can be varied from 48V to 800V . There is a vehicle with 80 kWh battery voltage at 325V

- 9) What would be the peak charging current (in A)?

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 58, 64

1 point

- 10) What is C-rate?

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 0.2, 0.3

1 point

- 11) Will you call it a slow charger or fast charger?

- ☐ Slow Charger  
☐ Fast Charger

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Slow Charger

1 point

There is a 20 kW charger with output voltage that can be varied from 48V to 800V . A small tempo operates at 48V and uses only 10 kWh battery.

- 12) What would be the peak charging current (in A)?

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 410, 430

1 point

- 13) What is C-rate?

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 0.9, 2.1

1 point

- 14) Will you call it a slow charger or fast charger?

- ☐ Slow Charger  
☐ Fast Charger

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Fast Charger

1 point

There is a 20 kW charger with output voltage that can be varied from 48V to 800V. A third vehicle uses 750V and uses 80 kWh battery

- 15) What would be the peak charging current (in A)?

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 24, 28

1 point

- 16) What is C-rate?

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 0.2, 0.3

1 point

- 17) Will you call it a slow charger or fast charger?

- ☐ Slow Charger  
☐ Fast Charger

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Slow Charger

1 point

- 14) Will you call it a slow charger or fast charger?

- ☐ Slow Charger

1 point