

Course outline

How does an NPTEL online course work?

Module 1 - Overview of Electric Vehicles in India

Module 2 - Vehicle Dynamics

- Announcement on Week 2
- Lecture 10 - Forces acting when a vehicle move
- Lecture 11 - Aerodynamic drag, Rolling Resistance and Uphill Resistance
- Lecture 12 - Power and Torque to accelerate
- Lecture 13 - Putting it all together - 1
- Lecture 14 - Putting it all together - 2
- Lecture 15 - Concept of Drive Cycle - 1
- Lecture 16 - Concept of Drive Cycle - 2
- Week 2 Slide Content
- Week 2 Feedback Form: Electric Vehicles and Renewable Energy
- Quiz: Week 2: Assignment 1
- Quiz: Week 2: Assignment 2
- Quiz: Week 2: Assignment 3
- Quiz: Week 2: Assignment 4
- Quiz: Week 2: Assignment 5
- Week 2: Solutions

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

Module 9: Renewable Energy - Introduction

Module 10: Renewable Energy - Solar and Wind Energy

Module 11: Renewable Energy

Live Session

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Week 2: Assignment 4

The due date for submitting this assignment has passed.

Due on 2021-08-18, 23:59 IST.

As per our records you have not submitted this assignment.

Q 2.3. a. For a 2-wheeler, e-rickshaw and sedan with specifications as given below, compute total traction force, Power and Torque required at 30 kmph and 80 kmph. Consider the pickup time to attain 30kmph and 80kmph to be 20 seconds. What would be the power and torque required if the 4-wheeler sedan goes to 160 kmph. Assume slope to be zero.

Compute the average acceleration power Pa as (Acceleration force * v)/2 and for computation of climbing power use Pg = Climbing Force*(v/3)

Vehicle	ρ (kg/m ³)	C _D	A (m ²)	μ	weight (kg)	Tyre radius (m)
2-wheeler	1.2	0.9	0.5	0.013	180	0.28
e-rickshaw	1.2	0.44	1.6	0.013	680	0.2
Sedan	1.2	0.35	2.5	0.013	1200	0.31

Vehicle	Traction Force at 30 km/h (N)	Traction Force at 80 km/h (N)
2-Wheeler	A	B
e-Rickshaw	C	D
Sedan	E	F

1) The value of A is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 110,130

0.25 points

2) The value of B is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 350,380

0.25 points

3) The value of C is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 360,430

0.25 points

4) The value of D is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1000,1200

0.25 points

5) The value of E is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 630,740

0.25 points

6) The value of F is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1700,1950

0.25 points

Vehicle	Power at 30 km/h (kw)	Power at 80 km/h (kw)	Torque at 30 km/h (Nm)	Torque at 80 km/h (Nm)
2-wheeler	A	D	G	J
e-Rickshaw	B	E	H	K
Sedan	C	F	I	L

7) The value of A is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.6,1.8

0.25 points

8) The value of B is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 2,4

0.25 points

9) The value of C is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 3,10

0.25 points

10) The value of D is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 5,9

0.25 points

11) The value of E is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 10,25

0.25 points

12) The value of F is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 20,42

0.25 points

13) The value of G is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 25,45

0.25 points

14) The value of H is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 70,85

0.25 points

15) The value of I is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 195,230

0.25 points

16) The value of J is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 95,105

0.25 points

17) The value of K is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 200,225

0.25 points

18) The value of L is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 530,575

0.25 points

If the 4-wheeler sedan goes from 0 to 160 km/h

19) What will be power required (in kW, correct up to 2 decimal places)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 100,130

0.5 points

20) What will be torque required (in Nm, correct up to 2 decimal places)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1100,1300

0.5 points

21) Assume the sedan is stuck on a climb 12° slope. It needs to start and have a acceleration of 0.5 m/sec². What is the starting Torque required?

18) The value of L is [correct up to 2 decimal places]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 530,575

0.25 points

If the 4-wheeler sedan goes from 0 to 160 km/h