



# PRESIDENCY UNIVERSITY

BENGALURU

Roll No.														
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--

## Mid - Term Examinations – October 2025

Date: 10-10-2025

Time: 02.00pm to 03.30pm

School: SOE	Program: B.Tech-EEE (COMMON TO ALL)	
Course Code : EEE3103	Course Name: Electric Vehicles and Battery Technology	
Semester: III/V/VII	Max Marks: 50	Weightage: 25%

CO - Levels	C01	C02	C03	C04	C05
Marks	26	24	-	-	-

### Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

### Part A

Answer ALL the Questions. Each question carries 2 marks.

5Q x 2M=10M

1	Apply your knowledge of EV history to explain why electric vehicles are regaining popularity today.	2 Marks	L3	C01
2	Classify the common motor configurations in EVs and show where each can be applied.	2 Marks	L3	C01
3	Apply the concept of tractive effort to explain its role in vehicle acceleration.	2 Marks	L3	C01
4	Apply your understanding of hybrid architectures to suggest which type (series or parallel) is more suitable for city driving and explain why.	2 Marks	L3	C02
5	Illustrate how power flows in a series hybrid drivetrain during vehicle operation.	2 Marks	L3	C02

### Part B

**Answer the Questions.****Total Marks 40M**

<b>6.</b>	<b>a.</b>	Illustrate the general configuration of an electric vehicle with a neat block diagram and explain the role of each subsystem.	<b>10 Marks</b>	<b>L3</b>	<b>CO1</b>
	<b>b.</b>	Illustrate the torque–speed and power–speed characteristics of a typical variable-speed electric motor and apply them to explain their significance in electric vehicle operation.	<b>10 Marks</b>	<b>L3</b>	<b>CO1</b>
<b>Or</b>					
<b>7.</b>	<b>a.</b>	Illustrate the tractive effort versus vehicle speed characteristics of a traction motor with a neat sketch and apply it to explain the operating regions of an electric vehicle.	<b>10 Marks</b>	<b>L3</b>	<b>CO1</b>
	<b>b.</b>	Illustrate how tractive effort is applied to overcome rolling resistance, aerodynamic drag, and gradient resistance during normal driving of an electric vehicle.	<b>10 Marks</b>	<b>L3</b>	<b>CO1</b>

<b>8.</b>	<b>a.</b>	Illustrate the general classifications of hybrid electric vehicles with a neat diagram and apply them to explain their role in improving vehicle performance.	<b>10 Marks</b>	<b>L3</b>	<b>CO2</b>
	<b>b.</b>	Illustrate the configuration of a series hybrid electric drivetrain with a neat block diagram and apply it to explain the function of each component.	<b>10 Marks</b>	<b>L3</b>	<b>CO2</b>
<b>Or</b>					
<b>9.</b>	<b>a.</b>	Illustrate the configuration of a parallel hybrid electric drivetrain with mechanical coupling using a neat diagram, and apply it to explain the role of each subsystem in power flow.	<b>10 Marks</b>	<b>L3</b>	<b>CO2</b>
	<b>b.</b>	Illustrate a parallel hybrid electric drivetrain with torque coupling using a neat diagram, and explain the power flow through the system in various operating modes.	<b>10 Marks</b>	<b>L3</b>	<b>CO2</b>