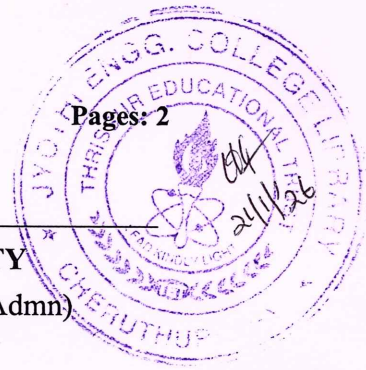


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S3 (Minor) Examination November 2025 (2024 Admn)



Course Code: MNMUT309

**Course Name: FUNDAMENTALS OF ELECTRIC AND HYBRID
VEHICLES**

Max. Marks: 60

Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 3 marks)

		CO	Marks
1	List out different EV/HEV classifications.	1	(3)
2	State the advantages and disadvantages of Mild and Full Hybrid Vehicles.	1	(3)
3	Explain how tractive effort influences the acceleration of Electric vehicles and Hybrid electric vehicles.	2	(3)
4	How does aerodynamic forces influence the vehicle stability?	2	(3)
5	Differentiate electric traction and hybrid traction?	3	(3)
6	Explain the control strategies used in hybrid drive-train topologies.	3	(3)
7	State any three limitations of current autonomous systems	4	(3)
8	State the applications of AI in Autonomous Vehicles.	4	(3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module -1

- | | | | |
|---|--|---|-----|
| 9 | a) Compare EVs and HEVs in detail in terms of construction, performance, and efficiency. | 1 | (6) |
|---|--|---|-----|

- b) Discuss the history and evolution of electric and hybrid vehicles. 1 (3)
- 10 Draw the general layout of an electric vehicle and explain its components. 1 (9)

Module -2

- 11 Compare the Indian, American Urban, and New European Drive Cycles. 2 (9)
- 12 Explain the effects of rolling, grade, and aerodynamic resistance on vehicle performance. 2 (9)

Module -3

- 13 Explain the switching techniques used in hybrid electric power trains. 3 (9)
- 14 With block diagrams, compare series, parallel, and series-parallel hybrid systems. 3 (9)

Module -4

- 15 Describe the role of AI in autonomous electric vehicles. 4 (9)
- 16 Explain the SAE levels (0–5) of vehicle autonomy in detail. 4 (9)
