

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

III - B.Tech II-Semester Regular Examinations (BR23), MAY - 2026

FUNDAMENTALS OF ELECTRIC VEHICLES(CE)

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

	Marks	CO	BL
1. a) List any four drawbacks of conventional vehicles?	(2M)	CO1	L2
b) Write any two applications of electric vehicles?	(2M)	CO1	L1
c) Define voltage source inverter (VSI)?	(2M)	CO2	L2
d) State the function of battery pack in EVs?	(2M)	CO2	L2
e) Mention any two advantages of BLDC motor?	(2M)	CO3	L2
f) What is torque-speed characteristic?	(2M)	CO3	L1
g) Define parallel hybrid vehicle?	(2M)	CO4	L2
h) What is a complex hybrid vehicle?	(2M)	CO4	L1
i) What is lead-acid battery?	(2M)	CO5	L1
j) Define Battery Management System (BMS).	(2M)	CO5	L2

PART-B (5X10 = 50M)

2a. Analyze the history and evolution of electric vehicles (EVs) and explain the current market scenario of EVs in India and across the world?	10(M)	CO1	L4
(OR)			
3a. Compare conventional vehicles and electric vehicles based on construction and performance?	10(M)	CO1	L4
4a. Illustrate the main components of an electric vehicle with a neat diagram?	10(M)	CO2	L3
(OR)			
5a. Analyze the operation of bidirectional DC-DC converters with neat sketch in EV systems?	10(M)	CO2	L4
6a. Compare the suitability of induction motor, brushless DC motor, and synchronous motor for electric vehicle applications based on their operating principles, efficiency, speed control, and performance characteristics?	10(M)	CO3	L4
(OR)			
7a. Analyze the advantages of switched reluctance motor for EV applications?	10(M)	CO3	L4
8a. Explain the various methods used to increase the driving range of Hybrid Electric Vehicles (HEVs)?	10(M)	CO4	L2
(OR)			
9a. Compare series and parallel HEV configurations?	10(M)	CO4	L4
10a. Briefly explain the concept, working principle, and applications of ultracapacitors and flywheel energy storage systems in electric vehicles?	10(M)	CO5	L2
(OR)			
11a. Compare Lithium-ion, Nickel-metal hydride, and Lead-acid batteries?	10(M)	CO5	L2
