

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.Tech.
BRANCH: EVT

SEMESTER : II
SESSION : SP/2023

SUBJECT: EE569 ELECTRIC VEHICLES

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Describe impact of IC engine on environment in terms of green-house emissions.	[5]	1 1
Q.1(b)	Explain power sharing modes in a Series Electric Vehicle.	[5]	1 1
Q.2(a)	Classify different types of DC machine-based field winding configurations using equivalent circuit diagram.	[5]	2 2
Q.2(b)	Explain the reason of flat torque profile in the case of DC shunt motor.	[5]	2 2
Q.3(a)	Analyze losses occurring in soft-switching converters as compared to conventional DC-DC converters.	[5]	3 3
Q.3(b)	Compare between Isolated and Non-isolated DC-DC converters using circuit diagram.	[5]	3 3
Q.4(a)	Distinguish between State of Charge and Depth of Discharge. Discuss their impact in battery health assessment.	[5]	4 4
Q.4(b)	Analyze the suitability of NMC, LiCoO ₂ , LiFePO ₄ batteries for EV applications in terms of specific power density, specific energy density, cost, lifespan, performance and safety.	[5]	4 4
Q.5(a)	Design basic block diagram of electric vehicle charging infrastructure.	[5]	5 5,6
Q.5(b)	Write a short note on Electric Vehicle Charging Tariff.	[5]	5 5,6

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