Graphic Era HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (Even) Semester Examination March 2025

Roll no.....

Name of the Course: B. Tech
Semester: 6th
Name of the Paper: Electric Vehicle Technology
Paper Code: TOE-601
Time: 1.5 hour **Maximum Marks: 50**

Note:
(i) Answer all the questions by choosing any one of the sub-questions
(ii) Each question carries 10 marks.

Q1. (10 Marks)

a. What are functions of the components used in an electric vehicle? Explain the impacts of electric vehicles on the environment. (CO1)

OR

b. What are the different types of batteries used in electric vehicles? Describe the working principle of lithium-ion batteries and their advantages in EV applications. (CO2)

Q2. (10 Marks)

a. What is the significance of vehicle dynamics. Derive governing equations to calculate tractive force to drive the vehicle? (CO1)

OR

b. Define the function of a Battery Management System (BMS) and its major components. (CO2)

Q3. (10 Marks)

a. Describe the types of electric vehicles. Explain the working of two of them. (CO1)

OR

b. What are the different communication protocols used in a Battery Management System (BMS). (CO2)

Q4. (10 Marks)

a. Explain power flow control in series and parallel hybrid electric vehicle with suitable block diagram. (CO1)

OR

b. Define State of Charge (SOC) and Depth of Discharge (DOD) in a battery. A 12V battery capacity of 500AH (Initially fully charged) that supplies a load of 0.6 ohm. Find the SOC of the battery after 3 Hrs. (CO2)

Q5. (10 Marks)

a. What is a driving cycle? Demonstrate the impact of different drive cycles on energy consumption and battery life in an EV. (CO1)

OR

b. Explain the significance of the battery thermal management system(BTMS) required in EV? What are the different technologies used in BTMS? (CO2)