

(Time: 3 Hours)

(Maximum Marks: 80)

- NB. 1. Que number one is compulsory**
2. Attempt any three out of the remaining five questions
3. Assume suitable data
4. Figures to the right indicate the maximum marks

- Q1 Attempt any FOUR:** (20)
- a) List the different methods of Electrical Vehicle charging technologies. (05)
 - b) List and explain the factors to be considered for the design of HVAC controller for an Electric Vehicle. (05)
 - c) Explain characteristics of Hybrid Electric Vehicle. (05)
 - d) Explain the importance of driven cycle in EV propulsion system design. (05)
 - e) Interpret why EMC designs are crucial for EV charging stations (05)
- Q2**
- a) Explain the components which contribute to the total tractive effort needed in EV propulsion system design. (10)
 - b) Explain on the design considerations and charging standards of AC chargers. (10)
- Q3**
- a) What are design considerations of DC fast charger and highlight the charging standard. (10)
 - b) Describe the acceleration and braking control used in Electric Vehicle. (10)
- Q4**
- a) Explain Ultra capacitor sizing in hybridization. (10)
 - b) Compare acceleration control and braking control in Electric Vehicle. (10)
- Q5**
- a) What are design considerations of AC charger. (10)
 - b) Discuss EMI EMC measurements and testing. (10)
- Q6**
- a) Explain shock protection methodology in Electric Vehicle. (10)
 - b) Explain in detail radiated emission and conducted emissions in Electric Vehicle. (10)
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