Total No. of Questions : 8]

SEAT No. :

PB2385

[Total No. of Pages : 2

[6263] 235

B.E. (Mechanical Engineering)

ELECTRIC AND HYBRID VEHICLE

(2019 Pattern) (Semester - VIII) (402051E) (Elective - VI)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Describe and illustrate the BCU, their types. **[9]**

b) Explain and estimate the Battery Performance Parameters. **[9]**

OR

Q2) a) Describe and Illustrate the Motors (Prime Mover) Classification, Construction, Working, and Control. **[9]**

b) Explain Battery thermal management system in detail. **[9]**

Q3) a) Describe and illustrate various electric drive-train topologies and their types for Three - Wheeler application. **[9]**

b) Explain the Power train Components and Sizing Calculation. **[8]**

OR

Q4) a) Describe and Illustrate the Dynamic equation related to mechanics of vehicle movement. **[9]**

b) Differentiate between Mechanical Differential and Electric Differential. **[8]**

P.T.O.

Q5) a) Describe and illustrate the Driving dynamics and Comfort as well as the Anatomy and Terminology of Car Package. **[9]**

b) Describe and illustrate the Front/Rear Suspension Systems Design for varieties of Electric Vehicle Configuration. **[9]**

OR

Q6) a) Describe and illustrate the Electrical vehicle design and packaging along with Hip Point/Seating Reference Point. **[9]**

b) What is Retrofitting? Describe and illustrate the retrofitting of Two-wheeler vehicles. **[9]**

Q7) a) Explain the Level 1, Level 2, and Level 3 chargers of electric vehicles. **[9]**

b) What are the Requirements for Charging System? **[8]**

OR

Q8) a) Write a note on **[9]**

i) AIS Charging Standards,

ii) BIS Charging Standards,

iii) Charging Infrastructure for Electric Vehicles -EVCI Guidelines

b) Describe and illustrate Hazard/Safety Management of Batteries during/after operations. **[8]**

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