

Total No. of Questions : 8]

SEAT No. :

P1030

[Total No. of Pages : 2

[5870]-1225

T.E. (Mechanical/Automobile)
HONORS - ELECTRIC VEHICLES
e-Vehicle System Design
(2019 Pattern) (Semester - II) (302033MJ)

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) *Figures to the right indicate full marks.*
- 3) *Draw the neat sketch wherever necessary.*

- Q1)** a) Explain electronic breaking system with its features and benefits in electric vehicles. **[4]**
- b) Explain in short steel wheel and alloy wheels and Differentiate between steel wheel and alloy wheels on basis of. **[8]**
- i) Cost and durability.
 - ii) Environmental working conditions
 - iii) Area of applications
 - iv) Effect on suspension system
- c) Explain The Need for Capacitor Banks or Ultra Capacitors in regenerative breaking on electric vehicles. **[8]**

OR

- Q2)** a) List out various defects in tires? **[4]**
- b) Elaborate the factors affecting on following while design the vehicles. **[8]**
- i) Driver
 - ii) Environment
 - iii) Load
 - iv) Type of Vehicle
- c) What do you mean by traction motor? Explain its significance with neat sketch in electric vehicles. **[8]**

P.T.O.

- Q3) a)** Explain the following terms (any two) [8]
- i) The open differential
 - ii) Torsen Differential
 - iii) Active differential
 - iv) Welded/Spool Differential
- b) Explain the significance of transmission component system design in detail? Explain the role of case, a drive part and a shift control device in transmission system? [8]

OR

- Q4) a)** Classify different types of transmission system used in automobiles? Explain hybrid electric vehicle transmission in detail? [8]
- b) Explain the Influence of effective case depth on bending fatigue strength and Shot peening strengthening and residual? compressive stress on tooth surface? [8]

- Q5) a)** What do you mean by battery layout? Explain lead acid battery layout with neat sketch? [8]
- b) Explain Constructional details of cell design related to Batteries? [8]

OR

- Q6) a)** Explain the process of degradation modeling and analysis. [8]
- b) Explain Battery Compartment Design for Crashworthiness and Cooling. [8]

- Q7) a)** Explain Ergonomics based Roll-cage/Frame design with neat sketches? [10]
- b) Explain structural Design aspect of Roll-cage/Body-Frame? [8]

OR

- Q8) a)** Explain the importance and process involved in Impact/Crash Analysis. [8]
- b) What do you mean by vehicle dynamics? Explain the components of vehicle dynamics with? [10]

