

Total No. of Questions : 8]

SEAT No. :

P1022

[Total No. of Pages : 2

[5870] - 1212

**T.E. (Mechanical/Automobile)**  
**HONORS - ELECTRIC VEHICLES**  
**e - Vehicle Technology**

**(2019 Pattern) (Semester - I) (302031MJ)**

*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) Write a short note on li-ion battery with its working principal. [4]  
b) What are the different chemistries of li-ion batteries? Make its comparative analysis on basis of power, energy and lifespan. [8]  
c) Explain the advantages and disadvantages of li-ion batteries. [8]

OR

- Q2)** a) Explain the following parameters of li-ion batteries in short (any two). [4]  
i) C-rate  
ii) E-rate  
iii) Storage capacity  
b) What is battery cell balancing? Explain the Issues and remedies for battery balancing. [8]  
c) What are the effects of overcharging and termination voltage accuracy on pack capacity of li-ion battery? Explain with suitable graph. [8]

- Q3)** a) Explain nickel-bromide batteries with advantages, disadvantages and applications. [8]  
b) Explain lead acid batteries with advantages, disadvantages and applications. [8]

OR

*P.T.O.*

- Q4) a)** Explain Nickel-Metal Hydride Batteries with advantages, disadvantages and applications. [8]
- b) Explain li-ion supercapaciter with advantages, disadvantages and applications. [8]

- Q5) a)** What do you mean by drive system in electric vehicles? Explain with its significance for manufacturers and drivers. [8]
- b) Write in short different types of motors used in electric vehicle. Differentiate between AC motors and DC motors. [8]

OR

- Q6) a)** What are the factors to be considered while Selection and sizing of the motor? [8]
- b) Explain different types of drives used in electric vehicle with neat sketches. [8]

- Q7) a)** Explain the significance of implementation of IOT in electric vehicle on basis of wireless sensor network with neat sketch wherever required.[10]
- b) List out the customer related issues for use of electric vehicles. Also explain Need for IOT in EV. [8]

OR

- Q8) a)** Explain the Significance of IOT for modes of fast and efficient charging in electric vehicles. [8]
- b) Write a short note on intelligent transport system with its advantages.[10]

