

Total No. of Questions : 8]

**PC2398**

SEAT No. :

[Total No. of Pages : 2

**[6354]-515**

**B.E. (Electrical)**

**ELECTRICAL AND HYBRID VEHICLE**

**(2019 Pattern) (Semester - VII) (Elective - IV) (403144B)**

*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) Draw neat diagrams whenever necessary.
- 3) Assume suitable data, if necessary.

- Q1)** a) Explain any one energy management strategies for EV's. [7]  
b) Write a short note on electric bus with a suitable example. [5]  
c) Describe EV fleet management. [6]

OR

- Q2)** a) Write a short note on Battery swapping system. [6]  
b) Draw and explain series hybrid configuration. [6]  
c) Mention merits and demerits of fuel cell vehicle. [6]

- Q3)** a) Write a short note on vehicle dynamics. [5]  
b) State different drive trains configuration in HEVs and explain any one. [6]  
c) Explain any one power management strategy used for HEV. [6]

OR

- Q4)** a) Describe the HEV modelling considering forward approach and reverse approach. [6]  
b) How fuel efficiency analysis is carried for PHEV. [5]  
c) Draw and explain HEV subsystem. [6]

*P.T.O.*

- Q5) a)** Which forces should be considered for EV design? State & explain it along with equations. [7]
- b) Describe important considerations for sizing of power converter. [6]
- c) Write a short note on electric vehicle network. [5]

OR

- Q6) a)** How to select size of EV motor? Which are the factors considered for it? [6]
- b) Draw and explain PMSM motor control for an EV application. [7]
- c) Discuss selection parameters for an EV's battery. [5]

- Q7) a)** State revised guidelines mentioned for charging infrastructure? [7]
- b) Explain in detail star labelling scheme for li-ion packs. [5]
- c) Write a short note on EV tariff. [5]

OR

- Q8) a)** Describe challenges for EV charging infrastructure as per revised guidelines. [7]
- b) Discuss FAME-II policy. [5]
- c) Explain any one EV startup in detail. [5]

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