

Reg. No. :

--	--	--	--	--	--	--	--	--	--

**Question Paper Code: 99372**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Open elective

Civil Engineering

19UEE972– ELECTRIC AND HYBRID VEHICLES

(Common to CSE, ECE, Mechanical, IT, Chemical Engineering branches)

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5x 20 = 100 Marks)

1. (a) Explain the electric hybrid vehicles with a neat sketch and discuss function of major electrical components involved in it. CO1- U (20)  
Or  
(b) Make use of road way position vector and develop tangent co-ordinate system and compare the same with fixed co-ordinate system . CO1- U (20)
2. (a) Explain the charging and discharging for lead acid battery with chemical reaction equation. CO2- U (20)  
Or  
(b) Draw and explain the performance characteristics of battery. CO2- U (20)
3. (a) Write a short notes CO3- U (20)  
(i) PMSM  
(ii) SRM  
Or  
(b) Explain the transition from motoring to generating action using a four quadrant drive and how the regenerative braking is achieved. CO3- U (20)
4. (a) Explain the given power train components with neat sketch.  
(i) Electric vehicle power train. CO4- U (10)  
(ii) Manual and Automatic transmission. CO4- U (10)

Or

- (b) Draw and explain the characteristics of Tractive Force versus CO4- U (20)  
vehicle speed for four speed transmission
5. (a) Analyze the function series, parallel, and series-parallel CO5- Ana (20)  
architectures of Hybrid electric vehicle power train.
- Or
- (b) Analyze the Initial acceleration of power train component sizing f CO5- Ana (20)  
Hybrid electric vehicles.