Reg. No. :

Question Paper Code: 99372

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Open elective

CivilEngineering

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.

<div align="center">Or</div>

    (b)   Analyze the Initial acceleration of power train component sizing f   CO5- Ana   (20)
            Hybrid electric vehicles.

99372