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Question Paper Code: 59372

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Open elective

Civil Engineering

15UEE972– ELECTRIC AND HYBRID VEHICLES

(Common to CSE, ECE, EIE, Mechanical, IT, Chemical)

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5x 20 = 100 Marks)

1. (a) Examine three main sources of Hybrid Electric Vehicles and compare the transmission path in a conventional Internal Combustion Engine with a Hybrid Electric Vehicle also describe in detail about the components of HEV. 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- Ana (20)

Or

(b) Draw and explain the battery cell structure with its components. CO2- U (20)
3. (a) Analyze the Speed –Torque characteristics, and and Torque production of switched reluctance motor. CO3- Ana (20)

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) Sketch and explain the suitable braking method, with speed torque characteristics in which the source can absorb the electrical energy. CO4- U (20)

Or

- (b) Explain the given power train components with neat sketch. CO4- U (20)
- (i) Electric vehicle power train
 - (ii) Manual and Automatic transmission.

5. (a) Analyze the function series, parallel, and series-parallel architectures of Hybrid electric vehicle power train. CO5- Ana (20)

Or

- (b) Sketch and explain the 2*2 vehicle architecture of series-parallel hybrid vehicle, where IC engine is coupled to the front wheel. CO5-U (20)