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**Question Paper Code: 59372**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Open elective

Civil Engineering

15UEE972– ELECTRIC AND HYBRID VEHICLES

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

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following Questions)**

1. When was the first electric car invented? CO1- R  
(a) 1830 (b) 1832 (c) 1885 (d) 1945
2. Which of the following vehicles produces zero emissions? CO1- R  
(a) Traditional (b) Hybrid (c) Electric (d) All of the above
3. Electric Vehicles are generally powered by \_\_\_\_\_ CO2- R  
(a) Aluminium batteries (b) Lead-acid batteries  
(c) Sodium batteries (d) Magnesium batteries
4. What voltage is likely to be available from the battery of an electric vehicle or hybrid? CO2- R  
(a) 12V (b) 24V (c) 48V (d) 300V
5. Which type of Motor is not preferred in EVs? CO3- R  
(a) PMDC (b) BLDC (c) Induction (d) DC Shunt
6. Which charging station charges fast CO3- R  
(a) DC (b) AC (c) Both AC & DC (d) None of the above
7. Which mode of operation is involved during Vehicle to Battery charging? CO4- R  
(a) Dynamic (b) Regenerative Braking (c) Motoring (d) Plugging

8. Which among the following constitutes the major load for an automobile battery CO4- R  
(a) brake light                      (b) self starter      (c) parking lights                      (d) spark plug
9. Which of the following is NOT the type of Hybrid Vehicle? CO5- R  
(a) Plug-in Hybrid    (b) Parallel Hybrid  
(c) Natural Gas for Vehicles                                      (d) Series Hybrid
10. Capacity of a battery is expressed in CO5- R  
(a) Ah                                      (b) Vh                                      (c) Wh                                      (d) KWh

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following Questions)**

11. Make use of road way position vector and develop tangent co-ordinate system and compare the same with fixed co-ordinate system . CO1- U      (8)
12. Draw and explain the performance characteristics of battery. CO2-U      (8)
13. Explain the transition from motoring to generating action using a four quadrant drive and how the regenerative braking is achieved. CO3-U      (8)
14. Draw and explain the characteristics of Tractive Force versus vehicle speed for four speed transmission. CO4- U      (8)
15. Analyze the function series, parallel, and series-parallel architectures of Hybrid electric vehicle power train. CO5- U      (8)