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Question Paper Code: 59372B

B.E. / B.Tech. DEGREE EXAMINATION, SEP 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) 1832 (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. Explain the electric hybrid vehicles with a neat sketch and discuss function of major electrical components involved in it. CO1- U (8)
12. Explain the charging and discharging for lead acid battery with chemical reaction equation. CO2-U (8)
13. Draw and explain the equivalent circuit of three phase induction motor. CO3-U (8)
14. Draw and explain the characteristics of Tractive Force versus vehicle speed for four speed transmission. CO4- U (8)
15. Sketch and explain the 2*2 vehicle architecture of series-parallel hybrid vehicle, where IC engine is coupled to the front wheel. CO5- U (8)