Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec– 2017**

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|  |  |  |  |
| **Code :** | **14EE3029** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTRIC AND HYBRID VEHICLES** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Discuss the economic and environmental impact of electric and hybrid vehicle. | CO1 | 14 |
| b. | Brief about the historical development of Electric and Hybrid Vehicle. | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | Brief about the factors involved in assessing the performance of an Electric Vehicle. | CO1 | 10 |
| b. | Discuss about the various configurations of Electric Vehicle. | CO1 | 10 |
|  |  |  |  |  |
| 3. |  | Explain about the vehicle dynamics of an Electric Vehicle. | CO1 | 20 |
| (OR) | | | | |
| 4. | a. | Elaborate the operation of a Solar Powered Electric Vehicle | CO1 | 10 |
|  | b. | Briefly analyze the fuel efficiency of HEV. | CO1 | 10 |
|  |  |  |  |  |
| 5. |  | Draw and explain the functional block diagram of Electric Propulsion System in electric and hybrid vehicles. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Discuss about the Variable Voltage Variable Frequency (VVVF) of Induction Motor Drive. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Describe the Braking system of EV, HEV and FCV. | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | Explain the basic principles, features and performance of a Ultracapacitor. | CO3 | 15 |
|  | b. | Why do ultracapacitors require balancing? | CO3 | 5 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Describe the operation of Flywheel. Explain the various flywheel technologies that could be used in Electric and Hybrid Vehicles. | CO3 | 20 |

ALL THE BEST