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



**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EE2024** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BASICS OF ELECTRIC AND HYBRID VEHICLE** | **Max. Marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Brief about the historical development of hybrid vehicle. | CO1 | 15 |
| b. | Compare and contrast electric vehicles and gasoline vehicles. | CO1 | 5 |
| **(OR)** | | | | |
| 2. |  | Illustrate the importance of aerodynamic drag and rolling resistance in tractive effort. | CO2 | 20 |
|  |  |  |  |  |
| 3. | a. | Discuss the parallel hybrid and series-parallel hybrid configuration of hybrid vehicle with necessary diagrams. | CO1 | 15 |
| b. | Sketch the diagram of series hybrid configuration. | CO2 | 5 |
| **(OR)** | | | | |
| 4. | a. | Differentiate between electric and hybrid vehicle. | CO1 | 5 |
| b. | Name the components of an electric drive train. | CO2 | 5 |
| c. | Portray the basic techniques for improving engine performance, efficiency. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | Recommend a DC to DC converter which can operate in all the four quadrants. | CO2 | 15 |
| b. | Give the applications of DC series motor. | CO1 | 5 |
| **(OR)** | | | | |
| 6. | a. | Describe the working of single phase fully controlled bridge rectifier fed DC motor drive with neat diagram. | CO1 | 15 |
| b. | Compare brushed DC motor with brushless DC motor. | CO2 | 5 |
|  |  |  |  |  |
| 7. | a. | Illustrate the working of super capacitor with neat diagram. | CO3 | 10 |
| b. | Discuss the usage of Fuel Cell in Electric and Hybrid Vehicles. | CO3 | 10 |
| **(OR)** | | | | |
| 8. | a. | Explain the working of any one type of power converter used for Switched Reluctance Motor with necessary diagram. | CO2 | 15 |
| b. | Outline the basic SRM drive system. | CO2 | 5 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the energy storage mechanism in flywheel neat diagram. Also mention its advantages and disadvantages. | CO3 | 10 |
| b. | Discuss the hybridization of various energy storages. | CO3 | 10 |