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

Question No 1,2,3,4,5 from module 1,2,3,4,5 respectively.

Question No. 6,7 could be from any module among the 5.



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

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| **Code :** | **18EI3010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **EMBEDDED AUTOMOTIVE SYSTEMS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
|  | | | | |
| 1. |  | Discuss in detail the different types of injection systems used in automobiles. | CO4 | 16 |
|  |  |  |  |  |
| 2. | a. | List out the sensors used in automobiles. Explain in detail on any two sensors with relevant application in cars. | CO1 | 12 |
| b. | Identify the actuator that acts like a switch. Explain the working of the same. | CO1 | 4 |
|  |  |  |  |  |
| 3. |  | Give the different technologies used in fuel cells. Elaborate on any two kinds that can be used for automobiles with its properties and advantages. | CO3 | 16 |
|  |  |  |  |  |
| 4. | a. | With relevant block diagram illustrate the implementation of anti-locking braking system. | CO5 | 8 |
| b. | Define engine management system. Analyze its effect on the vehicle performance. | CO4 | 8 |
|  |  |  |  |  |
| 5. | a. | Sketch the frame format of the following protocols.   1. CAN 2. LIN 3. Flex-ray | CO2 | 10 |
| b. | Discuss the performance of the In-Vehicle Network Architecture. | CO2 | 6 |
|  |  |  |  |  |
| 6. |  | Discuss the importance of exhaust system of an automobile and analyze the sensor application in exhaust system to maintain the emission standards. | CO3 | 16 |
|  |  |  |  |  |
| 7. | a. | List the requirement of an electric vehicle. | CO1 | 4 |
| b. | The battery management system of the electric vehicle is the most important element of the electric vehicle – Justify. | CO5 | 12 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. |  | Give a case study on onboard diagnostics board with detail description of its working. | CO6 | 20 |