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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14EI2018** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AUTOMOTIVE INSTRUMENTATION** | **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 Current trends in Modern Automobile. | CO1 | 10 |
| b. | Define engine performance terms power, BSFC, torque and thermal efficiency with relevant formulae and units. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | With a schematic layouts explain the multi point electronic fuel injection system | CO1 | 10 |
| b. | Discuss in detail about the engine emission control by three way catalytic converter system. | CO1 | 10 |
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| 3. | a. | With the aid of a neat sketch explain the construction and operation of a typical oxygen sensor used in vehicle. | CO1 | 10 |
| b. | Demonstrate the implementation of Detonation sensor in automobile. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Explain the Magnetic reluctance Crankshaft position sensor used in automobile. | CO1 | 10 |
| b. | Sketch and explain the working of solenoids and relay as actuators in Vehicle. | CO1 | 10 |
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| 5. | a. | Discuss in detail about the operation of CAN protocol with a neat diagram in automotive. | CO2 | 10 |
| b. | Illustrate the communication cycle of the FlexRay Protocol with the required diagrams. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | With an aid of neat sketch, explain the working principle of pneumatic suspension system. | CO3 | 10 |
| b. | Describe the working principle of torque converter with a neat diagram. | CO3 | 10 |
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| 7. | a. | Illustrate with a neat block diagram, the digital implementation of a Cruise Control System. | CO3 | 10 |
| b. | Discuss in detail about the operation of infotainment system with a neat diagram. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Describe the operation of automatic transmission System in automotive with a neat sketch. | CO3 | 10 |
| b. | Discuss in detail about the operation of traction and braking control with a neat diagram in automotive. | CO3 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the Hardware Design of ECU with Block Diagram. | CO3 | 10 |
| b. | Discuss in detail about OBD Certification. | CO3 | 10 |