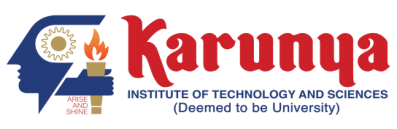
Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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

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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. | Give a brief explanation of why electronics are so widely used in today’s vehicle. | CO1 | 10 |
| b. | Discuss in detail about the operation of 4 stroke petrol engine with a neat diagram. | CO2 | 10 |
| **(OR)** | | | | |
| 2. | a. | Write short notes on:  (i)Altitude sensor. (ii)Throttle position sensors. | CO3 | 10 |
| b. | Discuss how the following terms are related to engine performance .  (i)Torque (ii)Calibration (iii)Thermal Efficiency | CO2 | 10 |
| 3. | a. | Explain in detail about the Most and Flex Ray Protocol. | CO2 | 10 |
| b. | Describe the operation of an air conditioning system in automotive with a neat sketch. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | With suitable sketches, explain the working of solenoids and stepper motors as actuators in vehicle. | CO2 | 10 |
| b. | Classify and elaborate the various components in a starting system with sketches. | CO2 | 10 |
| 5. | a. | Explain in detail about the manual transmission system. | CO2 | 10 |
| b. | Discuss in detail about the operation of CAN protocol with a neat diagram in automotive. | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | With a neat diagram discuss about the Electronic Steering system and their importance in driving operation. | CO3 | 10 |
| b. | Explain in detail about the Centre Locking and electric windows in automobile. | CO2 | 10 |
| 7. | a. | Discuss in detail about the operation of traction and braking control with a neat diagram in automotive. | CO2 | 10 |
| b. | Discuss in detail about the operation of infotainment system with a neat diagram. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | Describe the engine cranking and warm up control in automobiles. | CO2 | 10 |
| b. | Demonstrate the implementation of Anti-lock braking system with neat sketch. | CO2 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain about the temperature measurement techniques followed in automobiles with reference to coolant, engine temperature and exhaust gas. | CO2 | 20 |