**KUMARAGURU**
college of technology
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**B.E DEGREE EXAMINATIONS: APRIL / MAY 2023**

(Regulation 2018)

Sixth Semester

**ELECTRICAL AND ELECTRONICS ENGINEERING**

U18EEE0009: Automotive Electronics

## COURSE OUTCOMES

**CO1:** Gain the knowledge on electrical and electronics systems available in modern automobiles.

**CO2:** Understand the role of Electronics Control Unit in modern automobiles.

**CO3:** Outline the various stages of Integrated development environment to design an embedded system.

**CO4:** Understand the internals of various embedded system design to ensure occupant's safety and comfort.

**CO5:** Comprehend the fundamentals of vehicle communication protocols.

**Time: Three Hours**                                    **Maximum Marks: 100**

**Answer all the Questions:-**
**PART A (10 x 2 = 20 Marks)**
**(Answer not more than 40 words)**

| | | | |
|---|---|---|---|
| 1. | Summarize the importance of spark plugs in an automobile. | CO1 | [K2] |
| 2. | Outline the factors to be considered in selecting battery for an automobile. | CO1 | [K2] |
| 3. | Infer how emissions are controlled in automobiles. | CO2 | [K2] |
| 4. | Illustrate the working of generic electronic engine control system. | CO2 | [K2] |
| 5. | Outline the steps involved in software development cycle. | CO3 | [K2] |
| 6. | Compare interpreter and compiler. | CO3 | [K2] |
| 7. | Mention the purpose of Lambda sensor. | CO4 | [K1] |
| 8. | State the safety aspects in modern automobiles. | CO4 | [K1] |
| 9. | Draw the block diagram of $I^2C$ protocol. | CO5 | [K2] |
| 10. | List the features of LIN protocol. | CO5 | [K1] |

**Answer any FIVE Questions:-**
**PART B (5 x 16 = 80 Marks)**
**(Answer not more than 400 words)**

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|---|---|---|---|---|---|
| 11. | a) | Explain the starting system of an automobile with a neat diagram. | 10 | CO1 | [K$_2$] |
| | b) | Summarize the importance of voltage regulators and charging system. | 6 | CO1 | [K$_2$] |
| 12. | a) | Illustrate electronic ignition system configuration with its block diagram. | 8 | CO2 | [K$_2$] |
| | b) | Explain the powertrain subsystem of an automobile. | 8 | CO2 | [K$_2$] |
| 13. | a) | Write a short note on the various stages of Integrated Development Environment to design an embedded system. | 6 | CO3 | [K$_2$] |
| | b) | Illustrate the simple and sophisticated target system of IDE with neat diagrams. | 10 | CO3 | [K$_2$] |
| 14. | | Classify and explain any four sensors available in engine management system. | 16 | CO4 | [K$_2$] |
| 15. | | Explain the architecture and frame format of CAN protocol in detail. | 16 | CO5 | [K$_2$] |
| 16. | | Discuss the functionalities of various components in an infotainment system. | 16 | CO4 | [K$_2$] |

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