



B.E. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Sixth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECE0055: Automotive Electronics

COURSE OUTCOMES

- CO1:** Describe various mechanical systems in an automobile.
CO2: Illustrate different types of electronic systems in an automobile.
CO3: Outline the various stages of the Integrated development environment to design an embedded system.
CO4: Explain the various embedded systems used in automotive applications.
CO5: Compare 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)**

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|---|-----|-------------------|
| 1. When the crank angle sensor fails what function of an automobile will be affected the most? | CO1 | [K ₃] |
| 2. List the main parts of an exhaust system in a conventional automobile. | CO1 | [K ₂] |
| 3. Recall the main parts of a transmission system in an automatic automobile. | CO2 | [K ₂] |
| 4. State the gear used in an automatic speed adjuster in an automatic automobile. | CO2 | [K ₂] |
| 5. Differentiate between IDE and compiler. | CO3 | [K ₃] |
| 6. State the four Functions of RTOS used in Automotive Electronics. | CO3 | [K ₂] |
| 7. State the different principles on which different types of actuators in automobile vehicles work. | CO4 | [K ₃] |
| 8. Which sensors do you think are most needed in an automotive vehicle? Justify it. | CO4 | [K ₄] |
| 9. Outline the different types of buses used for communication in embedded systems. | CO5 | [K ₃] |
| 10. In the CAN frame and field description, RTR (Remote Transmission Request) is how many bit(s) and what does it indicate? | CO5 | [K ₃] |

**Answer any FIVE Questions: -
PART B (5 x 4 = 20 Marks)
(Answer not more than 80 words)**

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|--|-----|-------------------|
| 11. List the types of Braking systems that are available in automobiles. | CO1 | [K ₂] |
| 12. Which safety subsystem is a must in Automobiles wrt to BS – VI? | CO2 | [K ₃] |
| 13. What is PC based debugger in IDE environment? | CO3 | [K ₂] |
| 14. List some automobile sensors and actuators. | CO4 | [K ₂] |
| 15. Justify the use of FlexRay protocol in Automobiles. | CO5 | [K ₃] |
| 16. Summarize the merits of the CAN protocol and its applications. | CO5 | [K ₂] |

**Answer any FIVE Questions: -
PART C (5 x 12 = 60 Marks)
(Answer not more than 300 words)**

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|---|----|-----|-------------------|
| 17. Elaborate the different parts of the Power Train system in an automobile. | 12 | CO1 | [K ₂] |
| 18. With a neat sketch, explain the working principle of the ABS system of a vehicle. | 12 | CO2 | [K ₃] |
| 19. Discuss the environmental legislation pollution norms of Euro / Bharat standards. | 12 | CO2 | [K ₃] |
| 20. Explain the role of an integrated development environment in an Embedded environment. | 12 | CO3 | [K ₃] |
| 21. Explain how electronic systems will add value to an automobile in terms of comfort, safety, and easiness of driving. | 12 | CO4 | [K ₃] |
| 22. Explain the importance of Controlled area network protocol in Automobiles and discuss its advantages and disadvantages. | 12 | CO5 | [K ₃] |
