



B.E DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Fifth Semester

MECHATRONICS ENGINEERING

U18MCE0001: Automotive Electronics

COURSE OUTCOMES

- CO1:** Explain the basics concepts of automobile engines.
CO2: Describe the components of Engine Control system.
CO3: State the working principle of automotive sensors.
CO4: Describe the principle of vehicle network protocols.
CO5: Explain the working of various comfort system embedded in automobile.
CO6: Describe the working principle of automobile safety systems.

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. What are the main functions of an automobile engine? | CO1 [K ₂] |
| 2. Define the term 'Engine Control Unit (ECU)'. | CO2 [K ₂] |
| 3. Explain the role of air-fuel ratio in engine performance. | CO2 [K ₂] |
| 4. List any two types of automotive sensors and their uses. | CO3 [K ₂] |
| 5. What are the advantages of using electronic ignition systems? | CO3 [K ₂] |
| 6. What is CAN protocol in vehicle networking? | CO4 [K ₂] |
| 7. Brief the vehicle tracking system using GPS. | CO4 [K ₂] |
| 8. Describe the purpose of the cruise control system in automobiles. | CO5 [K ₂] |
| 9. Mention two comfort systems used in modern automobiles. | CO5 [K ₂] |
| 10. Define the term 'ABS' in the context of automobile safety. | CO6 [K ₂] |

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

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| 11. | Explain the different types of automobile engines and their working principles with neat diagram. | 16 | CO1 | [K ₂] |
| 12. | Describe the components of an engine control system with a neat diagram. Explain the functions of each component. | 16 | CO2 | [K ₂] |
| 13. | a) State and explain the working principles of the Oxygen sensor and Mass airflow sensor in automotive system | 8 | CO3 | [K ₂] |
| | b) Illustrate the components of the Engine Control System with neat diagrams. Discuss the effects of air/fuel ratio. | 8 | CO3 | [K ₂] |
| 14. | Describe the vehicle network communication protocols (CAN, LIN). Explain the differences between them and their applications in vehicle systems. | 16 | CO4 | [K ₂] |
| 15. | Explain the working of any four comfort systems in modern automobiles, such as air conditioning, power windows, seat heating, and centralized door locking systems | 16 | CO5 | [K ₂] |
| 16. | Describe the working principles of the following automobile safety systems of Airbags and Traction control in modern automotive vehicles. | 16 | CO6 | [K ₂] |
