



**B.E DEGREE EXAMINATIONS: APRIL / MAY 2023**

(Regulation 2018)

Sixth Semester

**AUTOMOBILE ENGINEERING**

U18AUE0010: Auxiliary Vehicle Systems

**COURSE OUTCOMES**

- CO1:** Apply the concept of embedded systems for automotive applications  
**CO2:** Outline the importance of stability and safety systems in automobiles.  
**CO3:** Interface automotive sensors and actuators with microcontrollers  
**CO4:** Obtain an overview of vehicle comfort systems.  
**CO5:** Review the telematics systems in modern vehicles.  
**CO6:** Recognize the various automotive security 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. List the advantages of using rollover bar used in cars  | CO4 [K <sub>2</sub> ] |
| 2. What are the components of a windshield wiper?  | CO4 [K <sub>2</sub> ] |
| 3. Define the term on-board diagnostics (OBD).   | CO1 [K <sub>2</sub> ] |
| 4. State the difference between open loop and closed loop control system.                                | CO3 [K <sub>2</sub> ] |
| 5. Mention the application of microprocessors in car engines.  | CO3 [K <sub>2</sub> ] |
| 6. Mention the sensor technology used for measuring throttle position and mention its mounting location. | CO1 [K <sub>2</sub> ] |
| 7. Write short notes on Vehicle Telematics?  | CO5 [K <sub>2</sub> ] |
| 8. Mention the role and importance of geographic information system (GIS) in automobiles.                | CO6 [K <sub>2</sub> ] |
| 9. List three types of Anti Theft Systems for cars.  | CO6 [K <sub>2</sub> ] |
| 10. How does a multi-point fuel injection system works?  | CO2 [K <sub>2</sub> ] |

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

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|-----|----|--|----|-----|-------------------|
| 11. | a) | Justify the need of pretensioners in seat belts and explain the working of seat belt pretensioner system with a schematic diagram.   | 08 | CO2 | [K <sub>3</sub> ] |
|     | b) | Explain the working mechanism of the airbag deployment process with the help of a schematic sketch.  | 08 | CO2 | [K <sub>4</sub> ] |
| 12. |    | Draw the layout of Distributorless system and explain the working mechanism also list out its advantages and disadvantages.  | 16 | CO3 | [K <sub>2</sub> ] |
| 13. |    | Explain the basic of ECU and functions. Describe the role of ECU in precise fuel management and perfecting Combustion.   | 16 | CO1 | [K <sub>2</sub> ] |
| 14. |    | Draw the block diagram of the Remote keyless entry system and explain its working in combination with vehicle immobilization.  | 16 | CO6 | [K <sub>2</sub> ] |
| 15. | a) | List out variables measured using chassis control sensors and Mention its associated technology for all measurements. Also indicate the suitable sensor mounting location and mode of measurement. | 12 | CO3 | [K <sub>2</sub> ] |
|     | b) | Explain working of park system in a vehicle and list out its types.  | 04 | CO5 | [K <sub>2</sub> ] |
| 16. | a) | Brief working of Cruise Control in automobiles and Differentiate cruise control system with adaptive cruise control system.  | 08 | CO4 | [K <sub>2</sub> ] |
|     | b) | Explain the working of hill assist and state its benefits.   | 08 | CO5 | [K <sub>2</sub> ] |

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