



## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

**Third Semester, M. Tech. - VLSI Design and Embedded System (MECE)**

**Semester End Examination; Dec - 2016/Jan - 2017**

**Automotive Electronics**

Time: 3 hrs

Max. Marks: 100

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

### UNIT - I

- |      |   |    |
|------|---|----|
| 1 a. | With neat diagrams, explain the four strokes of a typical SI engine.  | 8  |
|      | b. What do you mean by ignition in an IC engine?  | 2  |
|      | c. What are the components of an ignition system? Explain each of them.                                       | 10 |
| 2 a. | Briefly explain the working of a spark plug with neat diagrams of configuration and primary current waveform. | 6  |
|      | b. With a neat diagram, explain the disk braking system of an automobile.                                     | 6  |
|      | c. Explain steering with relevant diagram and graph.  | 8  |

### UNIT - II

- |      |   |    |
|------|---|----|
| 3 a. | Explain the optical method of measuring engine speed with relevant diagram and waveform.                      | 6  |
|      | b. Explain the role, construction and working of an EGR actuator.   | 6  |
|      | c. What is an EGO sensor? What are the desirable EGO characteristics? Explain with relevant diagrams.         | 8  |
| 4 a. | What do you mean by Hall element and Hall effect? Explain Hall effect position sensor with relevant diagrams. | 10 |
|      | b. Explain EGR actuator with a neat diagram.  | 10 |

### UNIT - III

- |      |  |    |
|------|--|----|
| 5 a. | Explain with a neat block diagram, electronic engine control system.       | 10 |
|      | b. Explain the following engine performance terms :                        |    |
|      | <span>i) Power</span> <span>ii) BSFC</span> <span>iii) Torque</span>       | 10 |
|      | <span>iv) Volumetric efficiency</span> <span>v) Thermal efficiency.</span> |    |
| 6 a. | Write short note on:   |    |
|      | <span>i) Remote keyless entry</span> <span>ii) GPS.</span>                 | 10 |
|      | b. Explain idle speed control with relevant diagram.                       | 10 |

### UNIT - IV

- |      |  |    |
|------|--|----|
| 7 a. | Explain microprocessor based cruise control system with relevant diagrams and equations. | 8  |
|      | b. Explain Anti-lock Braking System (ABS) with relevant diagram, equations and graphs.   | 12 |

- 8 a. With a neat diagram, throttle actuator which is a part of cruise control system. 10
- b. Write short notes on : 10
- i) Adjustable solve absorber      ii) Electronically controlled suspension.

**UNIT - V**

- 9 a. Explain : 10
- i) Dead reckoning navigation      ii) Sign post navigation.
- b. Write short notes on : 10
- i) Alternative fuel engines      ii) Advance Driver Information system.
- 10 a. Explain low tire pressure warning system with relevant diagram. 10
- b Explain collision avoidance Radar warning system with relevant block diagram and equations. 10

\* \* \*