***U.S.N*** | | | | | | | | | | |

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

***(An Autonomous Institution affiliated to VTU, Belagavi)***

**Sixth Semester, B.E. - Automobile Engineering**

**Semester End Examination; May / June - 2019**

**Automotive Electrics and Autotronics**

*Time: 3 hrs* *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
*ii) Assume suitably missing data if any.*

**UNIT - I**

| | | | |
|---|---|---|---|
| 1 | a. | Explain electrical power supply in conventional vehicle electrical systems and future electrical systems with neat sketches. | 10 |
| | b. | Write a short note on circuit diagrams and symbols used in automotive electrical systems. | 5 |
| | c. | List and explain in brief the assignments and requirements of plug-in connections. | 5 |
| 2 | a. | Classify the batteries in detail. Explain with neat sketch the construction and working of lead-acid battery. | 10 |
| | b. | Explain with neat sketch about specific gravity test for lead-acid battery. | 5 |
| | c. | What is sulphation? How to charge the sulphated battery? Explain. | 5 |

**UNIT - II**

| | | | |
|---|---|---|---|
| 3 | a. | Describe the principle, construction and working of DC generator of an automobile with neat sketches. | 8 |
| | b. | Compare the DC generator and alternator. Which is more advantageous and why? | 4 |
| | c. | What is the need of voltage and current regulator in DC charging system? Explain with neat sketch the construction and working of the cut-out relay. | 8 |
| 4 | a. | On what principles the starting motor works? Explain the construction and working principle of starting motor. | 10 |
| | b. | What are the different types of starting motor drives used in starting system of an automobile? Explain with neat sketch the working of any one in detail. | 10 |

**UNIT - III**

| | | | |
|---|---|---|---|
| 5 | a. | Discuss the development of lighting technology in an automotive lighting system. | 6 |
| | b. | Draw the wiring diagram of a typical passenger car lighting system. | 8 |
| | c. | List and explain about special purpose lamps. | 6 |
| 6 | a. | Describe with the help of neat diagrams the working of stop light switch and direction signal. | 6 |
| | b. | In detail explain the method of mounting and adjustment of head lamps. | 6 |
| | c. | State the function and explain the working principle of :<br>i) Wind screen wiper ii) Electrical horn | 8 |

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**UNIT - IV**

| | | |
|---|---|---|
| 7 a. | Explain the different micro controllers used in automobiles. | 10 |
| b. | List and explain electronic components used in automobiles. | 10 |
| 8 a. | Explain with schematic diagram of microcontroller peripheral modules. | 8 |
| b. | Explain the basic principles of semiconductor technology. | 6 |
| c. | Explain the manufacture of semiconductor components and circuits. | 6 |

**UNIT - V**

| | | |
|---|---|---|
| 9 a. | Discuss sensors applications in modern vehicles. | 5 |
| b. | Explain position sensors. Mention their advantages and disadvantages. | 5 |
| c. | Explain with neat sketches of throttle valve sensor and fuel level sensor. | 10 |
| 10. | With neat sketch and explain the following with applications:<br>i) Engine speed sensors<br>ii) Wheel speed sensors<br>iii) Steering-wheel-angle sensors<br>iv) Half-effect phase sensors | 20 |

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