



# 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; July / Aug. - 2022

Automotive Electrical and Autotronics

Time: 3 hrs

Max. Marks: 100

## Course Outcomes

The Students will be able to:

CO1: Explain the evolution of electrical systems, different accessories, construction, working principle and troubleshooting of battery is used for automotive application.

CO2: Explain the construction, working principle and identify troubles encountered in starting and charging systems.

CO3: Explain the working principle of lighting system and accessories.

CO4: Explain the working principle of various types of sensors and actuators used in automobile.

CO5: Understand the application of microcontroller in automobile.

**Note:** I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
I a.	Write the charging and discharging chemical equation of a lead acid battery.	2	L1	CO1	PO1
b.	What is the function of cut of relay?	2	L2	CO2	PO2
c.	What is the difference between speedometer and odometer?	2	L2	CO3	PO1
d.	Name the cables used in automobile.	2	L2	CO4	PO1
e.	What is the principle of Anti-Lock Braking System?	2	L2	CO5	PO1
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
1 a.	Discuss the principle of operation of a lead acid battery with neat sketch.	9	L2	CO1	PO2
b.	Describe the construction and working of the battery hydrometer	9	L2	CO1	PO2
c.	Discuss briefly the various methods of battery charging.	9	L1	CO1	PO3
<b>UNIT - II</b>		<b>18</b>			
2 a.	List the various types of starter motor drive and explain the principle of working of BENDIX drive.	9	L3	CO2	PO2
b.	What is an alternator? Compare it with generator. Which will you prefer and give reasons in support of your answer.	9	L2	CO2	PO3
c.	Explain with a neat circuit diagram the voltage regulator with cutout relay	9	L2	CO2	PO2
<b>UNIT - III</b>		<b>18</b>			
3 a.	Describe with the help of a neat sketch the constructional details of headlights of conventional type.	9	L2	CO3	PO1
b.	What is headlight Dazzle? Discuss the various causes of Dazzle.	9	L3	CO3	PO2
c.	Explain with wiring diagram of thermostatic type fuel gauge.	9	L2	CO3	PO1

**UNIT - IV****18**

- 4 a. With neat sketch explain the working principle of throttle position sensor. 9 L2 CO4 PO1
- b. Sketch and explain the working principle of actuator type fuel injector. 9 L2 CO4 PO1
- c. What is the function of temperature sensor in EFI system? Briefly explain its working with neat sketch. 9 L3 CO4 PO1

**UNIT - V****18**

- 5 a. Explain with block diagram the architecture of microcontroller used in an automobile. 9 L3 CO5 PO1
- b. Explain with neat sketch the working principle of electric power steering system. 9 L2 CO5 PO2
- c. Explain with the support of block diagram the tyre pressure monitoring system. 9 L2 CO5 PO2

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