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

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Automobile Engineering

Semester End Examination; July / Aug. - 2022

Automotive Embedded System

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Know the safety electronics and active 4 passive safety s/m's.
CO2: Know the systems and design of steer by wire, brake by wire, gas bi wire.
CO3: Understand the bas sensor types of sensor.
CO4: Analyze the electronic ignition s/m'.
CO5: The automotive embedded s/m microcontroller based s/m.

***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
	I : PART - A	**10**			
I a.	What is the need of Electronic Stability Program (ESP)?	2	L1	CO1	PO1
b.	Write a short note on seat belt system used in vehicles.	2	L1	CO2	PO1
c.	List any four sensors used in automobile.	2	L1	CO3	PO1
d.	Write a short note on electronic ignition system.	2	L1	CO4	PO1
e.	Describe CAN bus.	2	L1	CO5	PO1
	II : PART - B	**90**			
	UNIT - I	**18**			
1 a.	Briefly explain the principle of Anti-Lock Braking System (ABS).	9	L2	CO1	PO1,2
b.	Explain the following passive safety systems: i) Airbag ii) Seat belt iii) Child safety system iv) Pedestrian safety system	9	L2	CO1	PO1,2
c.	Explain any three infomatics electronic systems used in automobile.	9	L2	CO1	PO2
	UNIT - II	**18**			
2 a.	Explain the Steer-by- wire system and its design requirements.	9	L2	CO2	PO2
b.	Explain the construction and working of power-by-wire system.	9	L2	CO2	PO2
c.	Explain the brake-by- wire systems with its advantages.	9	L2	CO2	PO2
	UNIT - III	**18**			
3 a.	Explain the construction and working of crank angle position sensor with diagrams.	9	L2	CO3	PO1,2
b.	Explain the construction and working of mass air flow sensor.	9	L3	CO3	PO2
c.	Explain the construction and working of Throttle position sensor.	9	L3	CO3	PO2

Contd… 2

	UNIT - IV	**18**				
4 a.	With neat block diagrams, explain open loop and closed loop control system.	9	L2	CO4	PO1,2
b.	Explain the operating principle of Digital engine control system.	9	L3	CO4	PO2
c.	Explain engine cranking and engine warm-up control.	9	L2	CO4	PO2
	UNIT - V	**18**				
5 a.	Briefly explain the purpose and application of embedded systems in automobile.	9	L2	CO5	PO1,2
b.	Explain the following: i) GLS ii) GPSS iii) GMS	9	L3	CO5	PO2
c.	Explain the multiprocessor communication using CAN bus.	9	L2	CO5	PO2

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