KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

Regulation 2018

Sixth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECE0055: Automotive Electronics

COURSE OUTCOMES

CO1: Describe various mechanical systems in an automobile.

CO2: Illustrate different types of electronic systems in an automobile.

CO3: Outline the various stages of Integrated development environment to design an embedded system.

CO4: Explain the various embedded systems used in automotive applications.

CO5: Compare Vehicle Communication Protocols.

Maximum Marks: 100

Time: Three Hours

Answer all the Questions: -
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Name any one auxiliary system in the powertrain.	CO1	[K2]
2.	Differentiate manual and automatic transmissions.	CO1	[K2]
3.	Describe the role of ignition systems in vehicle operation.	CO2	[K3]
4.	Illustrate the role of electronics in emission control for vehicles.	CO2	[K3]
5.	Describe the contribution of debugging to the development process in an IDE.	CO3	[K3]
6.	Explain the characteristics of an Integrated Development Environment (IDE) and the process of beginning its utilization.	CO3	[K2]
7.	Describe the application of control elements and methodologies in automotive systems.	CO4	[K3]
8.	Explain the utilization of engine and vehicle dynamometers in software calibration.	CO4	[K2]
9.	Describe the significance of control networking in embedded systems.	CO5	[K3]
10.	Explain the functions of SPI, I2C and USB protocols in embedded systems.	CO5	[K2]

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

11.	a)	Describe the role of the exhaust system within the powertrain.	8	CO1	[K$_3$]
	b)	Explain the purpose of the rack and pinion steering system.	8	CO1	[K$_2$]
12.	a)	Explain the benefits of electronic systems for comfort and safety features in vehicles.	8	CO2	[K$_3$]
	b)	Explain the operation of a disc brake system in comparison to a drum brake system.	8	CO1	[K$_2$]
13.	a)	Describe the contribution of electronics to enhancing performance in vehicles.	8	CO2	[K$_3$]
	b)	Explain the functions of ABS, TCS, and ESP in the chassis subsystem.	8	CO2	[K$_2$]
14.	a)	Explain the significance of real-time operating systems (RTOS) and PC-based debugging in the context of an IDE.	8	CO3	[K$_2$]
	b)	Explain the hardware/software configuration in an IDE, including boot service and host-target interaction.	8	CO3	[K$_2$]
15.	a)	Explain about the list of sensors commonly used in engine management system.	8	CO4	[K$_2$]
	b)	During testing, which environmental conditions do Electronic Control Units experience?	8	CO4	[K$_3$]
16.	a)	Illustrate CAN, LIN, FLEXRAY, MOST, and KWP2000 protocols and their applications in vehicles?	8	CO5	[K$_3$]
	b)	Can you explain the significance of communication protocols in embedded systems?	8	CO5	[K$_3$]

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