KUMARAGURU
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B.E DEGREE EXAMINATIONS: MAY/JUNE 2023

(Regulation 2018)

Sixth Semester

AUTOMOBILE ENGINEERING

U18AUI6201T: Automotive Embedded Systems

COURSE OUTCOMES

CO1: Select suitable sensors for measuring parameters in automotive systems
CO2: Choose the appropriate actuator and driver for automotive applications
CO3: Outline the concepts of embedded systems
CO4: Design of hardware model for automotive system using microcontroller
CO5: Build codes for automotive embedded applications
CO6: Compare the wired and wireless communication protocols

Time: Three Hours   **Maximum Marks: 100**

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

1.	Explain the function of Knock sensor.	CO1	[K_2]
2.	Distinguish between MAP and MAF sensor.	CO1	[K_2]
3.	Identify the application of solenoid in automotive.	CO2	[K_3]
4.	Explain the function of Optoisolator.	CO2	[K_2]
5.	Identify the application of ADC in microcontroller.	CO3	[K_3]
6.	List the pin configuration of 8051.	CO3	[K_2]
7.	Build a RESET circuit for 8051 controllers.	CO4	[K_6]
8.	List the pins of LCD 16x2 display.	CO4	[K_2]
9.	Apply the concept of IoT platform in electric vehicle.	CO6	[K_3]
10.	Illustrate the use of serial communication in automotive	CO6	[K_2]

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

11.	a)	Analyze the working principle, mounting location and features of lambda sensor.	12	CO1	[K_4]
	b)	List the application of Hall effect sensor in automotive.	4	CO1	[K_2]
12.	a)	Design the circuit for Solenoid actuator to interface with 8-bit microcontrollers.	12	CO2	[K_6]

	b)	Explain the working principle of Piezoelectric Actuators.	4	CO2	[K$_2$]
13.	a)	Explain the 8051 Hardware architecture and write the features of 8051 microcontroller.	12	CO3	[K$_2$]
	b)	Explain the structure of the program for 8051 controllers with example.	4	CO3	[K$_2$]
14.	a)	Design of hardware and software to display the "AUTO KCT" using 16x2 LCD with 8051 microcontrollers.	12	CO5	[K$_6$]
	b)	Draw and explain the circuit diagram for interfacing 8051 with ADC.	4	CO4	[K$_2$]
15.	a)	Describe in detail the operation of CAN protocol and explain the CAN ECU Network in automotive system.	12	CO6	[K$_2$]
	b)	Distinguish between wired & wireless communication	4	CO6	[K$_2$]
16.	a)	Construct the digital sensor interface with 8051 microcontroller and write the embedded C program.	12	CO5	[K$_6$]
	b)	Construct the 11.0592 MHz oscillator circuit for 8051 controllers.	4	CO3	[K$_6$]

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