Reg. No.



(A constituent unit of MAHE, Manipal) SECOND SEMESTER M.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, MAY 2024

AUTOMOTIVE EMBEDDED SYSTEMS [AAE 5413]

REVISED CREDIT SYSTEM

Time: 3 Hours

Date: 09 MAY 2024

Max. Marks: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitably assumed.

Q.NO	Questions	Marks	СО	BTL
1A.	Differentiate between embedded systems and general computing systems, highlighting their distinctive features and functionalities. And also Mention the software tools utilized in the design process of an embedded system.	(05)	C01	L2
1B.	Analyze the organization and components of an embedded system within a four-wheeler automobile.	(03)	CO1	L4
1C.	Differentiate between Harvard and Van Neuman architecture of an embedded system.	(02)	CO1	L2
2A.	Consider 5 node network, Explain the process of route discovery in Ad hoc on demand vector (AODV). Include the roles of RREQ (Route Request) and RREP (Route Reply) packets and discuss how the protocol establishes and maintains routes dynamically.	(04)	CO2	L3
2B.	Explain the basic structure of a Local Interconnect Network (LIN) message frame. Describe the purpose of each field and how they contribute to the reliability of data transmission with the help of master and slaves.	(04)	CO2	L2
2C.	Briefly describe the different methods of Error Detection in Controller Area Network (CAN). Also sketch the Error transition state diagram.	(02)	CO2	L2
3A.	With the help of Diagram, explain the Standard CAN arbitration process, comment on which ID/Node going to win the bus access and why.		C02	L4
		(05)		

	CAN NODE	Identifier (HEX)	Identifier (Binary)			
	1	0×7F3	11111110011			
	2	0×6B3	11010110011			
	3	0×6D9	11011011001			
ЗВ.	Discuss the archit detailing the signif block and how the the processor.	(03)	СО3	L2		
3C.	Illustrate the fundamental instructions essential for performing the subtraction operation of two numbers utilizing an 8085 Microprocessor, elucidating the purpose and sequence of each instruction in the process.				СО3	L4
4A.	Develop an 8051-assembly language program to control an external device, such as an LED matrix or Motor.				CO4	L4
4B.	With suitable blow and features of Architecture (AUT	(03)	CO4	L3		
4C.	Explain any four to development proce	(02)	CO4	L2		
5A.	Discuss the impo Assistance system security can b communication us	(04)	C05	L4		
5B.	Choose one real-w system and analy impact on urban r addressing parki limitations or areas	(04)	C05	L4		
5C.	Explain the role of (Internet of Thing V2X (Vehicle-to- development and Roadways.	(02)	<i>CO5</i>	L4		