MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (AERONAUTICAL/AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2022

SUBJECT: AUTOMOTIVE COMMUNICATION SYSTEM [AAE -4041]

REVISED CREDIT SYSTEM

(28/11/2022)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

Q No	Question	Marks	CO attained	BT level
1A	Define Second time around echo effect? Derive range equation for following cases: 1. With ambiguity 2. Without ambiguity	**5**	**CO2**	**L3**
1B	Calculate the maximum range of Radar for the following specifications − 1. Peak power transmitted by the Radar, Pt=250KW 2. Gain of transmitting Antenna, G=4000 3. Effective aperture of the receiving Antenna, Ae=4m2 4. Radar cross section of the target, σ=25m2 5. Power of minimum detectable signal, Smin=10−12W	**3**	**CO2**	**L4**
1C	Define: 1. Bandwidth 2. Modulation and Demodulation 3. Bel and Decibel 4. Data transfer rate	**2**	**CO1**	**L1**
2A	Represent (2460)8 in binary.	**2**	**CO1**	**L1**
2B	A modulating signal m(t)=10cos(2π×103t) is amplitude modulated with a carrier signal c(t)=50cos(2π×105t). Find the modulation index, the carrier power, and the power required for transmitting AM wave.	**5**	**CO2**	**L4**
2C	Draw the block diagram of 1×8 De-Mux with the suitable truth table.	**3**	**CO1**	**L2**
3A	Discuss how the data gets transferred through Bluetooth?	**4**	**CO3**	**L3**

	What are types of Bluetooth networks?			
3B	Explain the process of trilateration used in GPS? How do satnavs calculate distance from time?	**4**	**CO3**	**L2**
3C	Mention the unique characteristic of LIN communication bus?	**2**	**CO4**	**L2**
4A	Explain any two error handling methods involved in CAN communication protocol?	**2**	**CO4**	**L3**
4B	With the help of Bitwise Arbitration diagram, explain which node ID going to win the standard CAN bus? Node Ids are: Node1:0×6B3 = 11010110011b Node2:0×6D9 = 11011011001b Node3: 0×659 = 11001011001b	**5**	**CO4**	**L3**
4C	Sketch the error transition state diagram and Discuss error confinement mechanisms.	**3**	**CO4**	**L3**
5A	How to find the optimized path from source to destination using AdHoc on demand vector communication protocol? Explain with an example.	**5**	**CO4**	**L3**
5B	Mention the different sensors and systems used in Advanced Driver Assistance Systems (ADAS)?	**3**	**CO5**	**L4**
5C	What are the major applications of inter vehicle communications.	**2**	**CO5**	**L4**