Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Vehicle Infotronics **Semester: VIII**
Program: B. Tech (ADE) **Time: 03 hrs.**
Course Code: MEAD 3004 **Max. Marks: 100**

Instructions: This question paper has three sections, Section A, Section B, and Section C.

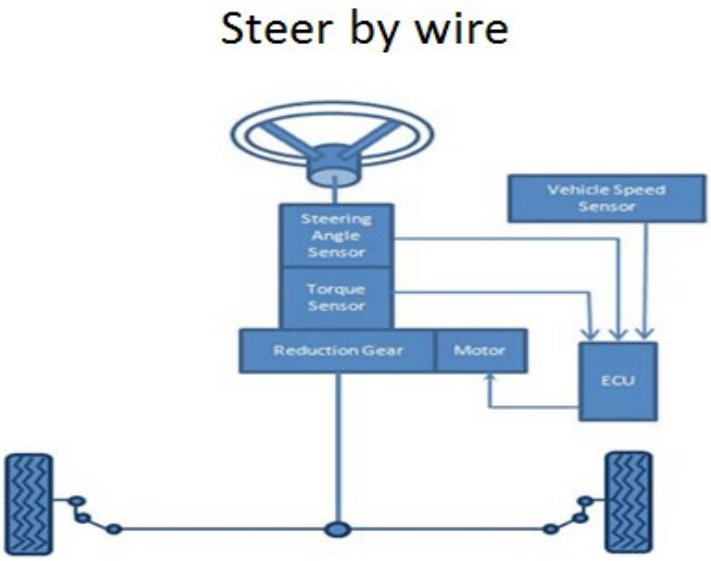
SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain in detail the concept of Vehicle Infotronics. List out the major application of Infotronics.	**4**	**CO1**
Q 2	Describe briefly, why legislation has a considerable effect on the development of the automotive industry.	**4**	**CO2**
Q 3	With a neat diagram analyze the classical V model development cycle.	**4**	**CO3**
Q 4	With a neat diagram explain understeer and oversteer.	**4**	**CO3**
Q 5	Explain the MISRA C guideline used for automotive software development.	**4**	**CO1**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Illustrate AUTOSAR? Explain the different layers used in AUTOSAR.	**10**	**CO3**
Q 7	Explain the working of the electronic stability program with a block diagram. Also, explain the advantage, and disadvantages of the ESP. Differentiate antilock braking System and traction control system with electronic stability program.	**10**	**CO4**
Q 8	Design a hydraulic circuit for the anti-lock braking system, where system pressure is 15 bar. Assume an appropriate solenoid operated directional control valve and actuator. With relay logic circuit, control hydraulic circuit of the antilock braking system.	**10**	**CO4**
Q 9	Assume three-node want to transmit data through the CAN bus and the 11bit identifier for node 1 is 11000001111, node 2 is 11000011100, and node 3 11000011000. With respect to graphical representation elucidate the CAN bus arbitration process. Consider node 1, node 2and node 3 having 32-bit data for transmission derive remote frame format and Data frame format considering SOF, Identifier, Control bit, data bit, and CRC bit of remote frame format and Data frame format.	**10**	**CO4**

SECTION-C
(2Qx20M=40 Marks)

Q 10	 Consider the above diagram as a steering system. 1) Design a hydraulic circuit for steering arrangement considering hydraulic motor as an actuator and use 4/3 DCV both side solenoids operated. 2) Design a relay-based circuit to control an electrohydraulic circuit. Assuming three inputs (STOP, Forward, and Reverse) and two outputs (Solenoid1 and Solenoid2) are required to build relay logic. 3) Design ECU and driver IC-based circuit/Block diagram to control electrohydraulic circuit for the development of steer by wire system. (Select useful sensor input)	**20**	**CO5**
Q 11	With neat diagram explain Single point injection system and Multi-point injection system. Name three advantages of a single-point injection system and multi-point injection system? What is the driving pressure in a single point and multi-point injection system? **OR** Explain the wire harness system in the vehicle. Why has in-vehicle networking become popular with respect to the wire harness system? List out major advantages of the conventional harness system.	**20**	**CO5**