Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, July 2020

Program Name: B. Tech (ADE)	**Semester : VI**
Course Name : Vehicle Infotronics	**Max. Marks : 100**
Course Code : MEAD 3004	**Duration : 3 Hrs.**
No. of page/s: 6	

1. Read the instruction carefully before attempting.
2. This question paper has two section, Section A and Section B.
3. There are total of six questions in this question paper. **One** in **Section A** and **five** in **Section B**
4. **Section A** consist of multiple choice based questions and has the total weightage of 25%.
5. **Section A** will be conducted online on BB Collaborate platform
6. **Section B** consist of long answer based questions and has the total weightage of 75%. The questions for section B shall also appear in BB Collaborate
7. The maximum time allocated to **Section A** is one Hrs.
8. **Section B** to be submitted within 24 hrs from the scheduled time (*exceptional provision due extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).
9. No submission of **Section B** shall be entertained after 24 Hrs.
10. **Section B** should be attempted after **Section A**
11. **The section B** should be attempted in blank white sheets (hand written) with all the details like programme, semester, course name, course code, name of the student, Sapid at the top (as in the format) and signature at the bottom (right hand side bottom corner)
12. Both section A & B have questions from entire syllabus.

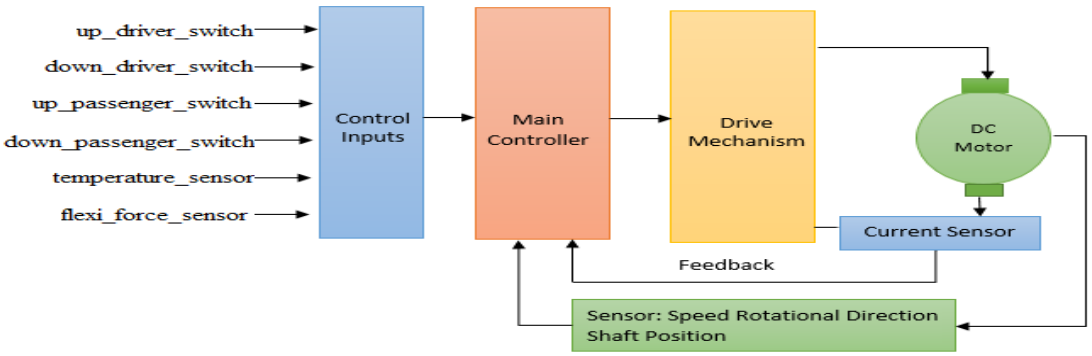
SECTION A **All questions are compulsory and carry equal marks (25* 1 = 25 Marks)**			
S. No.		**Marks**	**CO**
Q 1	1. Automobiles had changed from machinery to systems of Electrical Electronics systems. The following facts make this paradigm shift evident a) Cars have up to 2500 software controlled functions, representing 10 million lines of software code b) Up to 40 percent of a vehicles' costs are determined by electronics and software c) 90 percent of all innovations are enabled by electronics and software a. Point a and b b. Point a and c c. Point b and c d. All points 2. In a college, students are asked to develop a software. Which model would be preferable? a. Waterfall model b. Agile model c. V Cycle model d. Code and fix model 3. What is full form of SDLC? a. System Design Life cycle b. Software Design Life Cycle c. System Development Life Cycle d. Software Development Life Cycle 4. Which of the following model put much more emphasis on testing? a. Waterfall model b. Agile model c. Rapid action development model d. V model 5. In V cycle model Validation responsibility belongs to a. Developer b. Designer c. Tester d. QA Team 6. In V cycle model Verification responsibility belongs to a. Developer b. Designer c. Tester d. QA Team 7. In V model, why test cases are created before code? a. To gain the confidence in the system b. To find defects during dynamic testing	**1*25 = 25**	**5Q CO1** **5Q CO2** **5Q CO3** **5Q CO4** **5Q CO5**

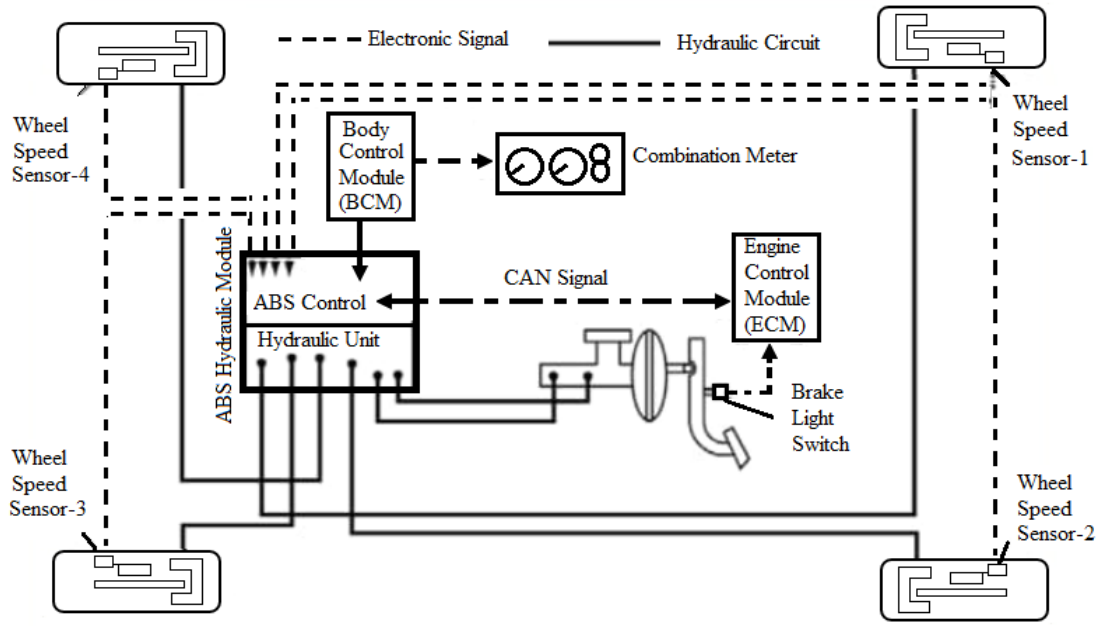
c. To meet project deadline
d. To prevent propagation of defect in next level

8. Build & Fix Model is suitable for programming exercises of how many LOC (Line of Code).
    a. 100 to 200
    b. 200 to 400
    c. 400 to 1000
    d. 1000 above
9. An electric window has a Hall type sensor fitted. Technician A says this is used to determine the window position. Technician B says this is part of the 'bounce back' safety feature. Who is right?
    a. A only
    b. B only
    c. Both A and B
    d. Neither A nor B
10. Electric power steering that does not have a mechanical connection between the steering wheel and the front wheels is known as:
    a. a crazy idea
    b. a good idea
    c. steer-by-wire
    d. scare-by-wire
11. When a wheel locks during the braking of a vehicle fitted with ABS, the modulator action will be:
    a. release, hold, build-up
    b. hold, build-up, release
    c. build-up, release, hold
    d. none of the above
12. In anti-lock braking systems apply how many times releasing braking pressure happen per second in the hydraulic circuit to ensure the wheels of cars equipped with ABS are practically impossible to lock even during panic braking in extreme conditions.
    a. 0 to 10 times
    b. 15 to 20 times
    c. 50 to 100 times
    d. More than 100 times
13. One concept for automotive collision avoidance involves
    a. braking rapidly in dangerous situations
    b. measuring the round-trip time of a radar pulse from protected car to collision object
    c. aircraft surveillance of highways
    d. wheel speed sensors
14. The function of antilock brake system (ABS) is that is
    a. reduces the stopping distance

b. minimizes the brake fade
c. maintains directional control during braking by preventing the wheels from locking
d. prevents nose dives during braking and thereby postpones locking of the wheels

15. V-Model development cycle is
    A. A software development model that illustrates how testing activities integrate with software development phases
    B. A software life-cycle model that is not relevant for testing
    C. The official software development and testing life-cycle model of ISTQB
    D. A testing life cycle model including unit, integration, system and acceptance phases
16. What is KWP2000?
    A. In vehicle networking protocol
    B. Verification and Validation (V&V) process tool
    C. Diagnostic communications standard
    D. Interrupt techniques
17. CAN logic what it follows?
    A. Wired AND logic
    B. Wired OR logic
    C. Wired Ex-OR logic
    D. Wired NOT logic
18. CAN frame format consist of how many data byte and CRC bit?
    A. 10 byte and 10 bit
    B. 8 byte and 15 bit
    C. 2 byte and 15 bit
    e. 8 byte and 10 bit
19. What is voltage Levels in CAN Protocol as per Bus level ISO 11898.
    a. CANH voltage level is 3.3 Volt, CANL Voltage Level is 1.5 Volt
    b. CANH voltage level is 1.5 Volt, CANL Voltage Level is 3.3 Volt
    c. CANH voltage level is 3.3 Volt, CANL Voltage Level is 3.3 Volt
    d. CANH voltage level is 1.5 Volt, CANL Voltage Level is 1.5 Volt
20. What is the difference between standard CAN and Extended CAN?
    a. The identifier bit length of standard CAN is 11 and for extended CAN 29.
    b. IDE bit for standard CAN 0 and for extended CAN 1.
    c. A only correct
    d. A and B both correct
21. The hybrid drivetrain concept can be implemented by different configurations as follows
    a. Series configuration
    b. Parallel configuration
    c. Series-parallel configuration
    d. All above configuration

	22. In the series hybrid system how many operating modes available for the power flow: a. One b. Four c. Three d. Two 23. In the series-parallel hybrid system how many operating modes available for the power flow: a. Five b. Four c. Six d. Two 24. In the block diagram representation of electric vehicle what is B,E,F,G,M, P and T represents what? a. Battery, ECU, Fuel tank, generator, motor, power converter and transmission. b. Battery, Engine, Fuel tank, generator, motor, power converter and transmission. c. Battery, Engine, Fuel tank, governor, motor, power converter and transmission. d. Battery, ECU, Fuel tank, generator, motor, power electronics and transmission. 25. What is full form of DSRC? a. Disciplined short-range communications b. Duplicate short-range communications c. Dedicated short-range communications d. Duplex short-range communications		
SECTION B **Answer all the questions.**			
Q 2	Design and develop an electrical circuit and control system for power window system used in a vehicle considering below diagram as different input for system development. Also explain need of various block used in the below block diagram.  	**15**	**CO3**

Q 3	What is ETC? With block diagram, explain ETC. Explain need of servo mechanism used in ETC system.	**15**	**CO4**
Q 4	Consider the ABS system shown below. Explain significance of each part in details with respect to design of anti-lock braking system. Design a hydraulic circuit and control circuit for the below figure.  	**15**	**CO5**
Q 5	Design electronic stability program (ESP) system. The following parameters must be included in designing: Block diagram, replacement of mechanical component with sensors and actuators and circuit diagram. How understeer and oversteer were eliminated in ESP equipped vehicle.	**15**	**CO2**
Q 6	Design intelligent drive by wire system with appropriate sensor and actuator. With block diagram, explain the drive by wire system. List out advantage and limitations of drive by wire technology. **OR** With neat block diagram explain different types by drive train techniques used in different class of vehicle: 1. Series hybrid 2. Parallel hybrid	**15**	**CO1**