Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (MECHATRONICS ENGINEERING)

MAKE-UP EXAMINATIONS

SUBJECT: AUTOTRONICS [MTE 4003]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.

1A.	Explain the common rail fuel injection system with a block diagram.	**4**
1B.	Suggest and explain the working of a suitable vehicle speed sensor. Justify your selection of sensor.	**6**
2A.	Discuss the effect of air/fuel ratio on the engine performance with a graph of performance variable versus the air/fuel ratio.	**3**
2B.	Propose a basic closed loop fuel control system for SI engines using a block diagram.	**3**
2C.	Differentiate between distributorless ignition system and conventional ignition system.	**4**
3A.	Discuss the different injection parameters that affect the quality of mixture formation in CI engines.	**3**
3B.	Explain the characteristic features of CAN protocol that makes it suitable for networking in a vehicle.	**3**
3C.	A friend of yours is crazy about driving at very high speed and loves to explore remote places. The main concern of his/her family is losing control of the vehicle during cornering at high speed. Suggest and explain the working of a special feature in steering system that assists in cornering at high speed.	**4**
4A.	Discuss the intervention of electronics in improving the automatic transmission control.	**4**

4B.	Imagine that you were driving with a high speed near a railway crossing and suddenly you realise that the railway gates were closed and you need to stop. In such a situation, which safety feature in your car avoids the collision and allows for manoeuvring your car even after applying sudden brakes? Discuss the working of the identified safety feature.	**6**
5A.	Compare active and passive safety system in vehicles.	**2**
5B.	Explain the construction and working of 3-way catalytic converter used in automobiles.	**4**
5C.	Discuss the significance of hydraulic damper in a unit-injection system.	**4**