Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

II SEMESTER M.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL 2017

SUBJECT: AUTOTRONICS & NAVIGATION [AAE 5201]

REVISED CREDIT SYSTEM
(20/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. What is an electromechanical switch? State the main functions of this switch. **(02)**

1B. What are the different loads on an Alternator? How are they? **(03)**

1C. Describe the construction & working of the sensor by which the air-fuel ratio is determined, with a neat drawing. **(05)**

2A. What are different protocol layers in CAN Protocol? Mention their attributes. **(02)**

2B. A rear wiper motor, having a power rating of 90 W, is connected to the battery having a current rating of 7 A and return path is given to the ground. The connection runs for 25ft from the Ignition switch. The battery generates a voltage of 13.2V when the engine is functioning. Investigate and suggest a suitable wire which will help in the proper working of the window. **[Use Table-1 in page 2]** **(03)**

2C. Explain the principle and working of the distributor-less ignition system, with a schematic diagram. Mention the advantages of DIS. **(05)**

3A. What are network nodes? Draw a schematic diagram to show its constituents. **(02)**

3B. Draw a schematic diagram and explain the circuit of a simple mechatronic system by which mobiles could be recharged with the trapping of solar energy in a car. On a rainy day, the same operation should be done by using the energy from the engine. **(03)**

3C. What is GPS Augmentation? Write and briefly explain five types of navigation system with neat diagram. **(05)**

4A. What do you mean by embedded computing in automotive? Explain with example. **(02)**

4B. What are the Intel 8085 instructions groups? Write all groups with important instructions. **(03)**

4C. Briefly highlights the application of mobile mapping, RFID, BAR code, geodetic navigation and LiDAR in modern vehicle navigation. **(05)**

5A. Explain the extracting landmarks for car navigation systems using GIS databases. **(02)**

5B. Write assembly programming for addition of two-16 bit numbers with an example. **(03)**

5C. What is spatial data and its characteristics in GIS? Explain the data modeling steps with an example. **(05)**

Table-1

AWG Gauge	Resistance Per 1000 Foot	Resistance Per Foot
20	10.3600 ohms	0.010360 ohms
18	6.5200 ohms	0.006520 ohms
16	4.0800 ohms	0.004080 ohms
14	2.5800 ohms	0.002580 ohms
12	1.6200 ohms	0.001620 ohms
10	1.0200 ohms	0.001020 ohms
8	0.6400 ohms	0.000640 ohms
6	0.4020 ohms	0.000402 ohms
4	0.2530 ohms	0.000253 ohms
2	0.1590 ohms	0.000159 ohms
1	0.1260 ohms	0.000126 ohms
0	0.1000 ohms	0.000100 ohms