
MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

V SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2018

SUBJECT: AUTOTRONICS [AAE 3151]

REVISED CREDIT SYSTEM
(19/11/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Describe the importance of CAFÉ in the automobile industry during the digital electronics revolution. **(02)**

1B. Explain when single-strand or multistrand wire should be used in automobiles. Elucidate the purpose and use of printed circuit boards. **(03)**

1C. Design a circuit to perform the functions mentioned below, with the help of DPDT relay, headlight position and car dashboard symbol. **(05)**

Toggle 1: Headlight should illuminate at the upper position, and the corresponding signal should be showed on the car dashboard (Blue LED).

Toggle 2: Headlight should illuminate at dipper position, and the corresponding signal should be chosen on the car dashboard (Red LED).

2A. "The stalled starter torque of the engine decreases with increasing the number of cylinders." Justify this statement. **(02)**

2B. Illustrate and describe the functionality of the freewheeling diode. Compare the advantages of freewheeling diode with the snubber circuit. **(03)**

2C. Illustrate and interpret the working of star wound alternator with 3 phase rectification circuit. Explain the significance of constructing a star wound alternator. **(05)**

3A. Explicate the method in which the spark plug acts as a sensor. Mention the parameter which is being identified by this procedure. **(02)**

3B.	Relate the different kinds of switches used in an automobile and mention their principle of functioning.	**(03)**
3C.	Distinguish between the type of sensors which works on the Nernst principle. Show the working of this sensor with an illustration which is commonly used in automobiles.	**(05)**
4A.	Compare relay with solenoid. Mention its advantages and shortcomings.	**(02)**
4B.	A DC motor of 8 pole lap wound is connected to a source of 240V supply. The armature has a resistance of 3 ohms and 500 conductors. The flux per pole is observed as 30 mWb. Determine the Speed and Torque developed if armature current is 60A. Determine the torque at 500rpm.	**(03)**
4C.	Describe the construction and working of the BLDC motor. Explain the opportunity of converting a BLDC into a stepper motor.	**(05)**
5A.	What is multiplexing in automotive networking and explain the importance of multiplexing.	**(02)**
5B.	Categorize buses based on transfer rates and describe about its representation.	**(03)**
5C.	Enlist the requirements of a bus. Describe the requirements by giving suitable examples.	**(05)**