
MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

II SEMESTER M.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, APR/MAY 2018

SUBJECT: AUTOTRONICS & NAVIGATION [AAE 5201]

REVISED CREDIT SYSTEM
(17/04/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. What is splice? State its importance. What distinguishes a conduit from a splice? **(02)**

1B. Explain Hall effect with a neat sketch. Predict what determines the dwell of ignition in a Hall Ignition Distributor. **(03)**

1C. Describe the construction and working of the Pre-engaged starter motor. **(05)**

2A. State the purpose of ground straps which are used in between the hood and the exhaust system of an automobile. **(02)**

2B. What are the different types of spark plugs? What modification can be brought about in electrodes which makes an even distribution of the flame? **(03)**

2C. Explain Distributor-less Ignition system with a schematic diagram. Discuss the merits and shortcomings of the same ignition system. **(05)**

3A. Enumerate the basic requirements of a starting system and various components of the starting system. **(02)**

3B. What is the importance of using Schmitt trigger in conjunction with CKP Sensor? Explain the methodology of the switching action by considering two resistors of 1 kΩ and 2 kΩ with a voltage output of 8 kV. **(03)**

3C. Derive the speed equation of a DC motor. Compare the motors based on the winding style. **(05)**

4A. Define Antenna Gain and Radiation intensity in radar equation. **(02)**

4B. Elucidate second time around echoes effect with an apt example. **(03)**

4C. Determine the power density at a target which is at a distance of 100km from a radar of 300MW from a lossless isotropic antenna. If this radar, now employs an antenna with a gain of 5000 and target has a cross-section of $1.2m^2$, what is the power density of the echo signal at the receiver? Also, find the maximum range at which the radar can detect the targets having a cross-section of $1.2m^2$. The minimum detectable signal of the radar is 10^{-8} mW and wavelength of the transmitted energy is 3cm. **(05)**

5A. How is civil moderate (CM) code different from civil long (CL) code? Categorize these civil codes in which they are used. **(02)**

5B. Describe the different errors in a GPS System and mention their originations. **(03)**

5C. Explain the process of triangulation with a neat schematic sketch. Also, give a brief account of differencing and mention its types. **(05)**