Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

ISEMESTER M.TECH. (AVIONICS)

END SEMESTER EXAMINATIONS, NOV/DEC 2019

SUBJECT: Digital Avionics & EMI/EMC [AAE 5152]

REVISED CREDIT SYSTEM
(19/11/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A.	Describe the application of complementary filter in the estimation of the aerodynamic angles.	**(02)**
1B.	Discuss how fault is characterized based on various factors.	**(03)**
1C.	Define the term fault tolerant avionics. Also describe various fault domains and common mode failures observed in avionics systems	**(05)**
2A.	Describe the various applications of aircraft networking.	**(02)**
2B.	Define inertial measurement unit with proper block diagram.	**(03)**
2C.	Describe directional static stability with all necessary diagrams.	**(05)**
3A.	Define AC constant frequency systems used in aircrafts.	**(02)**
3B.	Describe the various energy management techniques implemented in More Electric Aircrafts.	**(03)**
3C.	Discuss third generation flight decks in detail.	**(05)**
4A.	With a neat block diagram, explain the basic communication system	**(03)**
4B.	Discuss the classification of electromagnetic spectrum with example applications	**(03)**
4C.	With neat diagrams, explain the basic EMI sources in aircraft.	**(04)**
5A.	With neat diagrams, explain ground controlled approach system (GCA) for landing of aircrafts.	**(03)**
5B.	A fighter aircraft in level flight on a heading of 090^0 T and at an airspeed of 600m/s is operating a pulse Doppler radar at a frequency of 800MHz. A target is detected at the same altitude, bearing 000^0 R, heading 060^0 T at a speed of 300m/s. Find (a) relative radial velocity between the fighter and the target (b) resulting Doppler shift	**(03)**
5C.	With a neat diagram explain the architecture of CFDS	**(04)**