Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.TECH. (AVIONICS)

END SEMESTER EXAMINATIONS, FEB 2021

SUBJECT: DIGITAL AVIONICS AND EMI/EMC [AAE- 5152]

REVISED CREDIT SYSTEM
(24/02/2021)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain in detail the key features of Fly By Wire in simple diagrammatic form. In which situation, a Fly By Wire is classified as a 'direct electric link' system. **[05]**

1B. Recognize this cockpit display in figure 1 and explain its features. **[05]**

Figure 1

Also briefly explain the three operational control of a rotorcraft.

2A. From the block diagram of the bank angle demand loop of the heading control autopilot given in figure 2: **[05]**

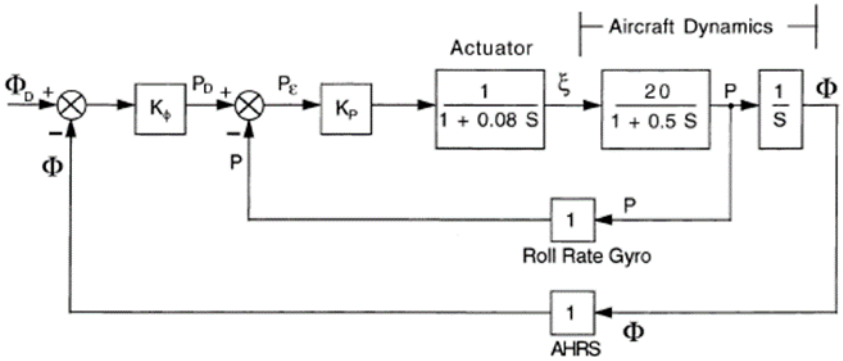

Figure 2

Determine the value of roll rate gain value K_P and find the transfer function $\frac{P}{P_D}$.

2B. Explain Approach Guidance Systems using the localizer and glide slope geometries in ILS/MLS Coupled Autopilot Control. **[05]**

3A. Draw the block diagram of a typical flight management system. List the tasks carried out by a flight management system. **[05]**

3B. Explain the mission criticality and its risk assessment process related to avionics. Which test is used to evaluate risk assessment analysis? Why? **[05]**

4A. List the different system level test requirements. Discuss any two system level test requirements. **[04]**

4B. Discuss the test execution constraints at the system level. **[04]**

4C. List the factors which will affect the avionics system. **[02]**

5A. Define pyrotechnic in aerospace application. Explain any two methods of pyrotechnic initiator. **[04]**

5B. Explain the different methods of protecting avionics interfaces from lightning suppression? **[04]**

5C. List the common approach to lightning protection On-ground Lightning EM Effects on Spacecraft. **[02]**