



B.E DEGREE EXAMINATIONS: NOV/DEC 2022

(Regulation 2018)

Seventh Semester

AERONAUTICAL ENGINEERING

U18AEI7203: Avionics

COURSE OUTCOMES

CO1:	Brief the functional description of typical avionics systems in aircraft.
CO2:	Describe the components and architecture of avionics systems.
CO3:	Interpret the data communication word in avionic data buses.
CO4:	Explain the working principle of aircraft communication, surveillance and navigation systems.
CO5:	Explain the architecture of flight control systems in aircraft.
CO6:	Describe the components and working of aircraft landing systems.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Name the avionics systems which are directly interfaced with the flight management system.	CO1	[K ₂]
2.	What is the functional similarity and difference between air data systems and Doppler navigation systems?	CO1	[K ₂]
3.	What is the main advantage of using a serial data bus to integrate the avionics systems?	CO2	[K ₂]
4.	Why are two different mode code addresses (00000 and 11111) used for indicating mode code function in the MIL-STD-1553B data bus?	CO3	[K ₂]
5.	Write the bits 32 to 1 (from MSB to LSB) in the BNR word in the ARINC 429 data bus standard to represent a "Selected Vertical Speed" of 2200 feet per minute. (The full scale range for the selected vertical speed is 16384, and the octal label is 104.)	CO3	[K ₃]
6.	What are the features of the ADS-B system for meeting air traffic control requirements?	CO4	[K ₂]
7.	Why the range measurement in GPS is termed as pseudorange?	CO4	[K ₂]
8.	Explain the principle of optical rate gyroscopes.	CO4	[K ₂]
9.	What is the basic function of autopilot in aircrafts?	CO5	[K ₂]
10.	What is the principle of TRSB-MLS?	CO6	[K ₂]

**Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)**

11.		Describe the components of a typical avionics system and explain the architecture of a microcontroller-based avionics computer.	(16)	CO2	[K ₂]
12.		Explain the three different word formats of MIL-STD-1553B data bus in detail.	(16)	CO3	[K ₂]
13.	a)	Explain the working of Secondary Surveillance Radar in air traffic control.	(6)	CO4	[K ₂]
	b)	Mention the components of GPS satellite signals and explain the basic principle of position determination in GPS.	(10)	CO4	[K ₂]
14.		Explain the threat detection and threat resolution algorithms used in TCAS.	(16)	CO4	[K ₂]
15.		Explain the basic principle and operation of VOR/DME navigation system.	(16)	CO4	[K ₂]
16.	a)	Discuss the redundancy concept in FBW flight control system with suitable diagram.	(10)	CO5	[K ₂]
	b)	With a neat block diagram explain the displacement autopilot system used to control the pitch attitude.	(6)	CO5	[K ₂]
