Hall Ticket No | | | | | | | | | | | Question Paper Code: AAE525

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-I

B. Tech VIII Semester End Examinations, May – 2020

Regulations: IARE - R16

AVIONICS AND INSTRUMENTATION

(Aeronautical Engineering)

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1	a	Briefly Explain the need of Data Bus? Give an note on working of ARINC 629?	**[7M]**
	b	Explain the development of Electronics in Aviation Industry? Write a short note on Evolution of Electronics in Aviation Industry?	**[7M]**
2	a	Discuss the nature of microelectronic device with suitable sketch? And use of this microelectronics in aviation field?	**[7M]**
	b	Write in brief about. a) Doppler Radar. b) Weather Radar.	**[7M]**

UNIT – II

3	a	What are the important units in Satellite communication system? Explain the function of each. Write short note on military cockpit.	**[7M]**
	b	Interpret briefly block diagram the working of Satellite communication system and its applications	**[7M]**
4	a	Discuss the basic principle of VHF communication and draw the block diagram of VHF Transmitter.	**[7M]**
	b	Draw the neat sketches of Air Data Probes and Explain the working of it?	**[7M]**

UNIT – III

5	a	What are the different types of navigation techniques used in avionics and explain inertial navigation system?	**[7M]**
	b	Explain the TCAS? Discuss the uses of TCAS in avionics system?	**[7M]**
6	a	Differentiate the different Autopilot modes in inertial sensors and global positioning systems	**[7M]**
	b	Explain the principal of distance measuring equipment's? Discuss the advantages of DME over the VOR?	**[7M]**

UNIT – IV

7	a	Differentiate the Local Area Augmentation System and Satellite Communication system.	**[7M]**
	b	Elaborate the Required Navigation Performance (RNP) in the navigation system Explain the Flight management System (FMS)?	**[7M]**
8	a	Interpret in detail about the Irreversible Flight Control system in navigation, ranging and landing systems?	**[7M]**
	b	Differentiate the objectives of Air Traffic Management in navigation, ranging and landing systems?	**[7M]**

UNIT – V

9	a	Explain the functioning of Forward-Looking RADAR and differentiate with Pulse-Doppler RADAR	**[7M]**
	b	Discuss the needs of air-to-air refueling for military aircraft in surveillance systems and auto-flight systems.	**[7M]**
10	a	Explain the Airbus model of FBW system and the FBW system of Boeing 777 aircraft	**[7M]**
	b	Explain the functioning of Pulse-Doppler RADAR in surveillance systems and auto-flight systems.	**[7M]**

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COURSE OBJECTIVES:

The course should enable the students to:

S. No	Description
I	Impart the knowledge in various types of Avionics systems, its components & its applications in aerospace industries.
II	Offer a rigorous avionics technology, Review of the basic system integration and the different type of avionics architectures.
III	Provide necessary knowledge to study the aircraft instrumentation sensors, displays and different type of sensors
IV	Give knowledge about military aircraft adaptation, avionics and mission system interface and gives the difference between civilian aircraft avionics and military aircraft avionics

COURSE OUTCOMES (COs):

CO 1	Describing aviation technology, bus systems and few basics of aircraft systems
CO 2	Differentiating aircraft instrumentation - sensors and displays systems
CO 3	Understanding communication systems and navigation aids
CO 4	Estimation of military aircraft adaptation mission system interface, navigation and flight management
CO 5	Acquiring knowledge on airborne radar, astrionics, avionics for spacecraft

COURSE LEARNING OUTCOMES (CLOs):

Students, who complete the course, will have demonstrated the ability to do the following:

AAE525.01	Understanding the evolution of electronics and microelectronics in avionics technology
AAE525.02	Interpret the need of bus systems in avionics
AAE525.03	Constructing the integrating modular avionics architectures, shelf systems and avionics packaging systems
AAE525.04	Understanding the concept of sensing system in aircraft instrumentation system.
AAE525.05	Development of different types of indication systems.
AAE525.06	Constructing different display systems in instrumentation system.
AAE525.07	Developing the concept of different communication system.
AAE525.08	Understanding different navigation systems, global and local area augmentation
AAE525.09	Understanding flight management system control and display unit
AAE525.10	Measuring of avionic and mission system interface, navigation and flight management
AAE525.11	Arranging airborne early warning, ground surveillance
AAE525.12	Labelling of electro-optics and the infra-red optics
AAE525.13	Characterizing of types of radar- pulse Doppler
AAE525.14	Determination Attitude and control of spacecraft, magnetometers
AAE525.15	Construction of command and telemetry in aviation technology

MAPPING OF SEMESTER END EXAMINATION TO COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	AAE525.01	Understanding the different designing concepts like preliminary design conceptual design and detail deign	CO 1	Understand
	b	AAE525.02	Interpret the need of bus systems in avionics	CO 1	Understand
2	a	AAE525.02	Interpret the need of bus systems in avionics	CO 1	Remember
	b	AAE525.03	Constructing the integrating modular avionics architectures, shelf systems and avionics packaging systems	CO 1	Understand
3	a	AAE525.04	Understanding the concept of sensing system in aircraft instrumentation system.	CO 2	Remember
	b	AAE525.05	Development of different types of indication systems	CO 2	Remember
4	a	AAE525.06	Constructing different display systems in instrumentation system.	CO 2	Understand
	b	AAE525.07	Developing the concept of different communication system.	CO 2	Understand
5	a	AAE525.08	Understanding different navigation systems, global and local area augmentation	CO 3	Remember
	b	AAE525.08	Understanding different navigation systems, global and local area augmentation	CO 3	Understand
6	a	AAE525.09	Understanding flight management system control and display unit	CO 3	Understand
	b	AAE525.10	Measuring of avionic and mission system interface, navigation and flight management	CO 3	Remember
7	a	AAE525.11	Arranging airborne early warning, ground surveillance.	CO 4	Understand
	b	AAE525.12	Labeling electro-optics and the infra-red optics	CO 4	Understand
8	a	AAE525.11	Arranging airborne early warning, ground surveillance	CO 4	Remember
	b	AAE525.13	Characterizing of types of radar- pulse Doppler	CO 4	Understand
9	a	AAE525.14	Determination Attitude and control of spacecraft, magnetometers	CO 5	Remember
	b	AAE525.15	Construction of command and telemetry in aviation technology	CO 5	Understand
10	a	AAE525.14	Determination Attitude and control of spacecraft, magnetometers	CO 5	Remember
	b	AAE525.14	Determination Attitude and control of spacecraft, magnetometers	CO 5	Understand

Signature of Course Coordinator **HOD, AE**