Hall Ticket No | | | | | | | | | | |

Question Paper Code: AAEC50

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.Tech VII SEMESTER END EXAMINATIONS (REGULAR) - DECEMBER 2023
Regulation: UG-20
AVIONICS AND INSTRUMENTATION
(AERONAUTICAL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ALL questions in Module I and II
Answer ONE out of two questions in Modules III, IV and V
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE – I

1. (a) Write a short note on evolution and development of electronics in aviation industry. [BL: Understand| CO: 1|Marks: 7]

   (b) Explain clearly the top down design procedure that is adopted in avionics system design and also list the factors on which avionics design is evaluated and explain each factor in brief. [BL: Understand| CO: 1|Marks: 7]

MODULE – II

2. (a) What is inertial sensing? Mention the uses of inertial sensing. Explain the position gyroscopes with neat sketch. [BL: Understand| CO: 2|Marks: 7]

   (b) Describe the basic principle of HUD and write its limitations. How are they overcome in HMD? [BL: Understand| CO: 2|Marks: 7]

MODULE – III

3. (a) Infer conventional flight control system and advantage of FBW to overcome the disadvantage of conventional FCS. [BL: Understand| CO: 3|Marks: 7]

   (b) Outline one of the most modern reliable communication systems used in aircraft with a block schematic. [BL: Understand| CO: 3|Marks: 7]

4. (a) Illustrate the principle of distance measuring equipments (DME). Write the advantages of DME over the VOR. [BL: Understand| CO: 4|Marks: 7]

   (b) Outline the need for a communication system in aircraft? Discuss one of the most modern reliable communication systems used in aircraft with a block diagram. [BL: Understand| CO: 4|Marks: 7]

MODULE – IV

5. (a) Summarize about the terrain awareness and warning system (TAWS) and explain the flight control requirements [BL: Understand| CO: 5|Marks: 7]

   (b) List the uses of TCAS in avionics system. Elucidate about generic interfaces between avionics and mission systems. [BL: Understand| CO: 5|Marks: 7]

6. (a) How the ILS approach is useful in bad weather condition? Differentiate the local area augmentation system and satellite communication system. [BL: Understand| CO: 5|Marks: 7]

   (b) Interpret in detail about the irreversible flight control system in navigation, ranging and landing systems. [BL: Understand| CO: 5|Marks: 7]

MODULE – V

7. (a) Summarize the functioning of forward-looking RADAR and differentiate with pulse-doppler RADAR. [BL: Understand| CO: 6|Marks: 7]

   (b) Elucidate the needs of air-to-air refueling for military aircraft in surveillance systems and auto-flight systems. [BL: Understand| CO: 6|Marks: 7]

8. (a) Elaborate how modern design techniques help in designing stability augmentation system and autopilot system? [BL: Understand| CO: 6|Marks: 7]

   (b) Demonstrate the airbus model of FBW system. Compare inertial navigation, doppler navigation and satellite navigation. [BL: Understand| CO: 6|Marks: 7]

– ○ ○ ◯ ○ ○ –