



# CBCS SCHEME

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21AE/AS62

## Sixth Semester B.E. Degree Examination, June/July 2024 Aircraft Systems and Avionics

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Analyze the conventional flight control system using a neatly labelled sketch and discuss the advantages and disadvantages of this system. (15 Marks)
- b. Sketch and label the independent brake system used in light aircraft. (05 Marks)

OR

- 2 a. Analyze the need for redundancy in the hydraulic system in a commercial jet aircraft using a simple schematic of a redundant hydraulic system. (15 Marks)
- b. List the advantages and disadvantages of a digital FBW system. (05 Marks)

### Module-2

- 3 a. Compare gravity fed and fuel pump fed fuel system using illustration and a short description. (10 Marks)
- b. Describe the working of a basic air cycle air-conditioning system in a commercial aircraft. (10 Marks)

OR

- 4 a. Describe the components and functioning of a Piston engine ignition system and discuss the need for two magnetos in this system. (10 Marks)
- b. Write short notes on :
  - (i) Anti-icing systems.
  - (ii) Fire detection and suppression systems. (10 Marks)

### Module-3

- 5 a. Explain the working principle of the ASI, VSI and Actimeter using a neat sketch. (10 Marks)
- b. List and describe the sensors used to measure the temperatures, pressures and rotational speed of an engine. (10 Marks)

OR

- 6 a. Explain the construction and working principle of the artificial horizon indicator and the heading situation indicator. (10 Marks)
- b. Explain the applications of the following instruments :
  - (i) Mach meter.
  - (ii) Piston engine Manifold Absolute Pressure (MAP).
  - (iii) IMU. (10 Marks)

**Module-4**

- 7 a. Describe the application of the following circuit control devices in an aircraft :
- (i) Toggle switches.
  - (ii) Rotary switches.
  - (iii) Micro-switches.
- (10 Marks)
- b. Explain the split bus-bar system with a neat sketch and discuss the advantages and disadvantages of this system. (10 Marks)

**OR**

- 8 a. Elucidate how electrical power is distributed to essential services, non-essential services and vital services during engine/power failure. (10 Marks)
- b. Explain the role of avionics in modern civilian and military aircraft. (10 Marks)

**Module-5**

- 9 a. Analyze if the following systems are useful for civilian aircraft :
- (i) MFDS
  - (ii) HUD
  - (iii) HOTAS.
- (10 Marks)
- b. Explain the salient features of the command word with reference to the MIL-STD-1553 databus. (10 Marks)

**OR**

- 10 a. Analyze the functioning of the Electronic warfare system and fire control system during a military attack mission. (10 Marks)
- b. Explain the term Avionics Equipment Fit and describe the process for selection of avionics equipment. (10 Marks)

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