



# CBCS SCHEME

15AE81

**Eighth Semester B.E. Degree Examination, Jan./Feb. 2023**

## **Avionics**

Time: 3 hrs.

Max. Marks:80

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

### Module-1

- 1 a. Explain vital services with examples. (06 Marks)
- b. Illustrate the significance of each position of the code used in aircraft cable, 2 D 3 B 2 3 P. (10 Marks)

OR

- 2 a. Draw and explain the routing chart of temperature sensing switch and warning system. (10 Marks)
- b. What is the significance of the line drawn over a letter or signal function when related to the input or output of logic gate? (06 Marks)

### Module-2

- 3 a. Define pitch gimbal servo error and inner roll gimbal servo error. (06 Marks)
- b. Explain with neat diagram the concept of stable platform. (10 Marks)

OR

- 4 Aircraft data:  $m = 16000$  kg, overall length = 14.5 m, wing span = 11 m,  $S = 50$  m<sup>2</sup>,  $I_y = 2.5 \times 10^5$  kgm<sup>2</sup>,  $V_T = 300$  m/s (600 knots approximately), wing incidence/g at 600 knots = 2/3 degree/g, static margin = 12% negative,  $M_h = 5 \times 10^6$  Nm/radian,  $M_q = 5 \times 10^5$  Nm/radian per s. From the above derive a suitable pitch control law. Neglecting lags in the actuator response, non linear effects, structural resonance. Notch fitters etc. [ $\omega_0 = 6.3$ ,  $\xi = 0.6$ ] (16 Marks)

### Module-3

- 5 a. List the basic flight instruments used on the aircraft represent with a schematic diagram basic 'six' and 'basic T' type of flight instrument grouping. (08 Marks)
- b. Draw a functional block diagram and explain the digital air data computer used for onboard air data processing. (08 Marks)

OR

- 6 a. What is an oscillator? How an oscillator generates sine and square wave forms? (08 Marks)
- b. Briefly explain the following: (i) Notch antenna. (ii) Slot antenna. (08 Marks)

### Module-4

- 7 a. Write short notes on the following: (i) EPROM (ii) EEPROM (06 Marks)
- b. With a neat schematic block diagram, explain the overall avionics system architecture for a military aircraft. (10 Marks)

OR

- 8 a. Briefly discuss the following:  
i) HOTAS (10 Marks)  
ii) HUD.  
b. List the advantages and disadvantages of liquid crystal display for use in flight deck instrument display. (06 Marks)

Module-5

- 9 a. Briefly explain the different elements of electronic warfare. (08 Marks)  
b. Briefly explain the following:  
i) Pulse Radar (08 Marks)  
ii) Navigation system.

OR

- 10 a. Give a brief description about Avionics equipment fit. (08 Marks)  
b. With the help of a schematic diagram, briefly explain the different word formats used in MIL STD 1553B data bus. (08 Marks)

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