

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

K 4017

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Seventh Semester

Aeronautical Engineering

AE 1401 — AVIONICS

(Regulation 2004)

Time : Three hours

Maximum²: 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give the need for standard documents in the design of avionics systems.
2. What is a volatile memory and give examples?
3. Give the advantages of digitization.
4. What is an autopilot?
5. Define HOTAS.
6. What is meant by jammers in electronic warfare?
7. What is brick walling or partitioning in avionics architecture?
8. Define glass cockpit.
9. What is strap down navigation?
10. What is a flight management system (FMS)?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the major design drivers for avionics system? (6)
(ii) Describe the various 'ilities' in avionics systems. (10)

Or

- (b) With a neat block diagram explain the integration of different avionics system.

12. (a) Explain the interface of a seven segment LED with the microprocessor to display a binary data.

Or

- (b) (i) Compare the Memory mapped I/O and Peripheral mapped I/O in microprocessor. (6)
(ii) Explain 8085 microprocessor architecture. (10)
13. (a) (i) Discuss the various avionics architectures in detail. (10)
(ii) Explain the coupling methods used in MIL STD 1553B. (6)

Or

- (b) Explain the ARINC 429 data bus in detail. 3
14. (a) (i) Discuss the types of color CRTs used in cockpit displays. (8)
(ii) Describe the working of LED, LCD and plasma displays and give their characteristics. (8)

Or

- (b) (i) Describe the layout of a cockpit. (8)
(ii) Describe voice recognition & speech synthesis technology. (8)
15. (a) Describe a FBW flight control system and its characteristics and redundancy concept in detail.

Or

- (b) (i) What are the communication systems used in modern aircrafts? (5)
(ii) Explain the types of INS and their merits and demerits in detail. (11)

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

R 3024

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Seventh Semester

Aeronautical Engineering

AE 1401 — AVIONICS

2

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the term Avionics Systems.
2. List few tasks carried out by FMS.
3. Differentiate between Centralized, Federated and Distributed Architectures.
4. What is the need for Manchester II biphase encoding?
5. Define Aliasing.
6. Redundancy management can account for 60% to 70% of total computer throughput, Justify the statement.
7. Name a few types of CRT.
8. What is a combiner?
9. What is the bandwidth of current communication channel?
10. Bring out the necessity for certification in civil aircraft.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the salient features that enhances the need for avionics in civil and military aircraft and also in space systems.

Or

B.

- (b) With a neat block diagram explain typical avionics systems.

12. (a) Discuss the bus protocol in MIL-STD 1553B and the word formats.

Or

- (b) (i) What is the need for ARINC 629 standard and how is it different from MIL STD 1553B. (8)

- (ii) Explain FTP and use of two different data rates in ARINC 429. (8)

13. (a) Explain 8085 microprocessor architecture and its operations.

Or

- (b) (i) Describe flip-flop as a storage element. (6)

- (ii) Explain memory mapping, memory address lines, memory word size and memory classification. (10)

14. (a) With a neat block diagram explain Head Up display, multifunction displays, and Multifunction keys in a civil and military aircraft.

Or

- (b) (i) Compare the following display technologies; CRT, LCD, LED and EL. (8)

- (ii) Explain DVI concept in a cockpit. (8)

15. (a) (i) Explain the relation between reliability and maintainability. (6)

- (ii) Discuss Radar Electronic Warfare. (10)

Or

- (b) (i) Explain inertial sensors and how are they used in inertial navigation systems. (8)

- (ii) Described fly-by-wire flight control systems. (8)

Time : 5

1. W

2. W

3. W

4. W

5. D

la

6. G

7. W

8. W

la

9. D

10. Li

Reg. No. :

3	0	5	0	5	1	0	1	7	0	7
---	---	---	---	---	---	---	---	---	---	---

C 3020

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Seventh Semester

Aeronautical Engineering

AE 1401 — AVIONICS

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are major drivers for Avionics in Civil transport aircraft?
2. Name atleast five Air data sensors.
3. What is aliasing?
4. Differentiate between volatile and non-volatile memories.
5. How is Federated Architecture different from centralized Architecture?
6. What is the need for two different speeds in ARINC429 data bus?
7. What is MFD and what is special about it?
8. What is HOTAS and what is the need for it?
9. How are Reliability and Maintainability related to each other?
10. Give the difference between ECM and ECCM.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain clearly the top down design procedure that is adopted in Avionics System design. (8)
- (ii) List the factors on which Avionics design is evaluated and explain each factor in brief. (8)

Or

- (b) Explain the various layers of avionics systems used in a typical airplane with a neat sketch. (16)
12. (a) With a neat sketch explain 8085 microprocessor architecture in detail. (16)

Or

- (b) (i) Draw the functional representation of ROM memory cell and explain the concept underlying the ROM. (8)
- (ii) Describe with a block schematic how a digital computer can be used to measure analog signal. (8)
13. (a) Explain MIL STD 1553B databus in detail bringing out clearly the bus architecture, protocol, word and message formats and coupling methods. (16)

Or

- (b) (i) List the evolution of Avionics Architecture starting from First generation to Fourth generation. (6)
- (ii) Describe in detail about one of the third generation Avionics Architecture with block schematics. (10)
14. (a) (i) Compare and contrast the display technologies CRT, LED, LCD, EL and plasma panel. (6)
- (ii) What are the various types of CRTs used in Civil and Military aircraft and explain them in detail. (10)

Or

- (b) (i) Explain the basic principle of HUD and what are its limitations? How are they overcome in HMD? (10)
- (ii) What are special features of DVI? (6)

15. (a) (i) Explain the operation of Inertial Navigation System. (6)
- (ii) What is digital fly by wire control, explain its salient features with the block Schematics in comparison with the conventional flight control system. (10)

Or

- (b) (i) What is the need for a communication system in an aircraft? (4)
- (ii) Explain one of the most modern reliable communication systems used in aircraft with a block schematic. (12)

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--

V 4007

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Seventh Semester

Aeronautical Engineering

AE 1401 — AVIONICS

(Regulation 2004)

Time : Three hours

Maximum: 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the major drivers for Avionics systems in a typical civil transport aircraft?
2. Equipments in Avionics system are different from ground based equipment in many ways. Justify.
3. List few advantages of digital systems over analog systems.
4. What is sampling frequency?
5. Distinguish between pave pace and pave pillar architecture.
6. What is the need for two different speeds in ARINC 429?
7. Give some examples for DVI.
8. What are the major factors to be considered for designing a HMD?
9. Justify the need for communication system in a civil transport aircraft.
10. Differentiate between ECM and ECCM.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the role of Avionics in civil, military aircraft and space systems. (10)
(ii) Discuss the design issues of Avionics system for civil, military and space systems. (6)

Or

- (b) With a neat sketch explain a typical Avionics sub system. (16)
12. (a) With a neat sketch explain 8085 microprocessor and bring out its salient features and its role in Avionics systems. (16)

Or

- (b) (i) Discuss the problems encountered in digital data. (8)
(ii) Discuss the salient features of various memories in a digital computer. (8)
13. (a) (i) Compare the different Avionics system architectures and bring out their merits and demerits. (10)
(ii) Explain the role of timing in the ARINC 629 transmission with relevant sketches. (6)

Or

- (b) Discuss the word format of MIL-STD-1553 B in detail. (16)
14. (a) (i) Explain the role of various colour CRTs and flat panel displays in head down display. (12)
(ii) What is meant by data fusion? (4)

Or

- (b) (i) What is HUD and explain its principal of operation with a neat diagram. (10)
(ii) Explain virtual cockpit. (6)
15. (a) (i) Discuss the various classification of Navigation system. (10)
(ii) What is electronic warfare? (3)
(iii) Justify the need for certification. (3)

Or

- (b) (i) With a block diagram, explain Flight Control System. (8)
(ii) Differentiate between fly by wire and fly by light flight control system. (8)