

Reg. No. :

Question Paper Code : 80006

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Aeronautical Engineering

AE 8402 — AIRCRAFT SYSTEMS AND INSTRUMENTS

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write a short note on speed brakes and spoilers.
2. Classify types of the retraction system.
3. Name any four basic control system components.
4. Mention a few advantages of FBW control systems over analog systems.
5. What is vapor lock?
6. Write about the crossfeed system and its significance in balancing.
7. What is meant by purging the system, in fuel and oxygen system?
8. What are the primary components of the cooling pack?
9. What is TCAS?
10. What is the role of BITE in the aircraft maintenance process?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the working principle and operation of landing gear retraction system with neat sketch.

Or

- (b) What are the various types of brake system? Explain them with neat sketch.

12. (a) Describe digital fly by wire with a neat sketch and discuss its advantages over the analog control system in detail.

Or

- (b) Explain in detail about the working and the advantage of Powered Assisted Control System.

13. (a) Write detail notes on following fuel systems with necessary figures.

(i) Gravity-feed system (7)

(ii) Fuel-pump system (6)

Or

- (b) Explain the lubrication system for a jet engine with neat sketch.

14. (a) Differentiate de-icing and anti - icing techniques. Discuss pneumatic de-icing system in detail.

Or

- (b) Explain the air cycle cooling system and vapor – cycle cooling system of an aircraft with necessary diagrams.

15. (a) Write detailed notes of the following.

(i) Principles of Gyroscopic Instruments (5)

(ii) Turn Coordinators (4)

(iii) Turn-and-Slip Indicator. (4)

Or

- (b) Explain the following air data systems with a neat diagram:

(i) Altimeter

(ii) Airspeed indicators.

PART C — (1 × 15 = 15 marks)

16. (a) Brief about the Pitot-static system, and explain how it got integrated with various aircraft instruments and equipment.

Or

- (b) Discuss, how the mission of an aircraft determines the type of the landing gear system, and explain various types of landing gear systems in detail.