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D 4005

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

Fourth Semester

Aeronautical Engineering

AE 1252 — AIRCRAFT SYSTEMS AND INSTRUMENTATIONS

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by an air data computer?

2. What is meant by rhumb line?

3. Enumerate the advantages of pneumatic system over hydraulic system?

4. What are the different types of shock absorbers used in landing gears?

5. What is vapour lock and list down its causes?

6. What are the advantages of air turbine starters?

7. List down the methods of fire detection in reciprocating engine aircrafts.

8. What are the components of a simple vapour cycle system?

9. What are the limitations of a free gyroscope?

10. What are the common errors associated with navigation instruments?

PART B — (5 × 16 = 80 marks)

11. (a) (i) State the functions of the principal units that comprise an Inertial Navigation System. (10)

(ii) What are the differences between INS and IRS from operational point of view? (6)

Or

(b) (i) What are the principal components and instruments that comprise a basic air data system? (8)

(ii) Write short notes on Fully powered flight controls. (8)

12. (a) (i) What are the components of a pneumatic system. Explain with neat sketches a typical pneumatic power system used in aircraft power plants. (10)

(ii) Explain air pressure breake system. (6)

Or

(b) (i) What are the different types of landing gears used in aircraft? (6)

(ii) Explain typical landing gear system used in aircraft. (10)

13. (a) (i) Explain with neat sketches the principle and working of high tension magneto ignition system used in aircraft power plants. (12)

(ii) What are the essential properties of lubricating oils? (4)

Or

(b) Classify the different types of inertial starters used in reciprocating engine starting system. Explain the principle and working of any two.

14. (a) (i) Explain with neat sketches an evaporative vapour cycle system and discuss its merits and demerits. (10)

(ii) Discuss anti–icing methods used in A/C systems and deicing in an aircraft system? (6)

Or

(b) What are the requirements of an ideal fire detector system? Explain the principle and working of fire detector system, used in Aircraft.

15. (a) (i) What are the input and output axes of a Gyroscope? Explain with the aid of a diagram, how a Gyroscope precesses under the influence of an applied force. (8)

(ii) Explain the operation of a stall warning and stick shaker system. (8)

Or

(b) (i) Explain with neat sketches the construction and working of an altimeter. (8)

(ii) What are the various types of engine instruments? Briefly explain each one of them. (8)
