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Eighth Semester B.E. Degree Examination, June/July 2016
Aircraft Systems and Instrumentation

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Explain the operation of a push-pull rod control system used for operating the elevator through a powered actuator unit with a neat sketch. (10 Marks)
- b. Explain the following with a neat diagram.
 - i) Mechanical actuation
 - ii) Electro – hydraulic actuation. (10 Marks)
- 2 a. Explain the following :
 - i) Hydraulic fluid, with examples. What are its advantages?
 - ii) Power packs, with relevant diagram
 - iii) Hydraulic actuators, with relevant diagram. (12 Marks)
- b. Draw a sketch of simplified bleed air system and associated aircraft systems. Explain the same. (08 Marks)
- 3 a. Explain the gravity feed fuel systems, with neat diagram. (10 Marks)
- b. With a help of neat sketch explain fuel tank. Name some of the fuel tanks used. (10 Marks)
- 4 a. With neat sketch explain the importance of cabin distribution system. (08 Marks)
- b. Explain the following with neat diagram.
 - i) Vapour cycle cooling system.
 - ii) Liquid cooling system. (12 Marks)

PART – B

- 5 a. Under instrument grouping, explain both flight instruments and power plant instruments grouping, with a neat sketch. (10 Marks)
- b. Describe the principle of operation of a head up display with a schematic diagram. (10 Marks)
- 6 a. With a neat sketch, describe the mach warning system. (10 Marks)
- b. Describe altitude – alerting system, with a neat sketch. (10 Marks)
- 7 a. With the aid of diagrams, describe how a ball type of bank indicator indicates.
 - i) A correctly banked turn.
 - ii) A turn to star board in which the aircraft is over banked. (10 Marks)
- b. Define gyroscope. Mention its three degrees of freedom. Explain the term gimbals systems of a free (or) space gyroscope, gyroscopic inertia (or) rigidity and precession; and angular momentum. (10 Marks)
- 8 a. Explain the turbine vibration monitoring system, with neat sketch. (10 Marks)
- b. Explain typical automatic temperature – control engine system, with neat sketch. (10 Marks)

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