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10AE848

Eighth Semester B.E. Degree Examination, June/July 2018
Aircraft Systems and Instrumentation

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. What is the function of flight control system? Also explain the primary and secondary control surfaces with a neat sketch showing all the control surfaces in a typical commercial airliner. (08 Marks)
- b. Differentiate between power assisted and fully powered flight controls. (04 Marks)
- c. Briefly explain Electro-Mechanical Advanced Actuator. List how the various actuator types may be used for different actuation task on a typical civil Airliner. (08 Marks)
- 2 a. What are the advantages and disadvantages of Hydraulic system? (06 Marks)
- b. Explain a simple hydraulic system, with the help of a neat sketch. (08 Marks)
- c. What is the use of bleed air? (06 Marks)
- 3 a. Explain the generalized fuel system of large transport aircraft and also list the characteristics of aircraft fuel system. (12 Marks)
- b. Explain the Engine oil system. (08 Marks)
- 4 a. What are the salient requirements necessary for the successful functioning of an environmental control system? (06 Marks)
- b. List the two different types of ice-protection system and briefly explain these systems with application on aircraft. (08 Marks)
- c. Explain the vapour cycle cooling system, with a neat sketch. (06 Marks)

PART – B

- 5 a. Define Quantitative and Qualitative displays. (02 Marks)
- b. What do you understand by the term "head up-display"? With the aid of diagrams describe how required basic flight data is displayed to a pilot. (08 Marks)
- c. Explain the instrumentation grouping and Navigation Instruments, with neat sketch. (10 Marks)
- 6 a. With a neat sketch, describe mach meter and vertical speed Indicator. (14 Marks)
- b. Describe altitude – alerting system, with a neat sketch. (06 Marks)
- 7 a. Define the two fundamental properties of a gyroscope and on what factors do these properties depend? (06 Marks)
- b. Write the Limitations of a free Gyroscope and what do you understand by the terms 'gimbal lock' and 'gimbal error'? (08 Marks)
- c. Explain turn and bank indicator in detail, with diagrams. (06 Marks)
- 8 Write short notes on the following :
 - a. Measurement of speed (05 Marks)
 - b. Measurement of Temperature (05 Marks)
 - c. Measurement of pressure (05 Marks)
 - d. Measurement of Fuel quantity. (05 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank space.