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10AE45

Fourth Semester B.E. Degree Examination, June/July 2013
Elements of Aeronautics

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Write a brief note on historical development in aeronautics. (10 Marks)
b. Differentiate mono planes and Bi-planes. (06 Marks)
c. What is basic difference between? Hot air ballon and aircraft? (04 Marks)
- 2 a. Define airfoil. Write a note on airfoil nomen-clature. (06 Marks)
b. What are different types of air vehicles and their classification? (08 Marks)
c. Draw a neat sketch of fixed wing aircraft and mention the different component of fixed wing aircraft and their functions. (06 Marks)
- 3 a. Explain lift and drag. (04 Marks)
b. Explain basic concept of control and stability. (04 Marks)
c. Drive the relation between temperature pressure and altitude. (12 Marks)
- 4 a. Prove that the Newton's second law of motion and Lagrange's equation are equivalent. (12 Marks)
b. State Kepler's law. (04 Marks)
c. Describe briefly the characteristic of upper atmosphere. (04 Marks)

PART – B

- 5 a. Draw neat sketch of typical wing and fuselage structure and explain importance of functional component used in it. (10 Marks)
b. List various metallic and non-metallic materials used in aircraft and write a short note on titanium alloy. (10 Marks)
- 6 a. General classification of I.C. engines and describe various cylinder arrangement used in I.C. engines powered aircraft. (10 Marks)
b. Explain with neat sketch aircraft propeller engine and turbo jet engine. (10 Marks)
- 7 a. Explain with sketch magic diagram of air conditioning system and it is operations. (10 Marks)
b. What is purpose of aircraft fuel system? Describe two fuel system with simple sketch. (10 Marks)
- 8 a. List and describe the various primary and secondary flight control surface incorporated in aircraft. (10 Marks)
b. What is navigation system and what are classification of navigation system used in air craft? (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.