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10AE45

Fourth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Element of Aeronautics

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1
 - a. What are hot air balloons? (02 Marks)
 - b. State the working principle of hot air balloon. (04 Marks)
 - c. Enumerate the advantages and disadvantages of monoplanes and Biplanes. (06 Marks)
 - d. Discuss the historical developments in Aeronautics. (08 Marks)
- 2
 - a. Define an Aircraft and classify it. (06 Marks)
 - b. What do you mean by aerostats and aerodynes? (04 Marks)
 - c. With neat sketch, explain the nomenclature of an airfoil. (08 Marks)
 - d. What is the function of aircraft control surfaces? (02 Marks)
- 3
 - a. Define ISA and state its importance. (04 Marks)
 - b. Explain briefly how the lift is generated. (06 Marks)
 - c. Calculate the standard atmosphere value of pressure, temperature and density at a geopotential altitude of 14 km. (10 Marks)
- 4
 - a. Write a short note on : i) Ascent through the atmosphere ii) Planetary entry. (06 Marks)
 - b. State and explain the three laws of Kepler about planetary motion. (10 Marks)
 - c. The period of revolution of earth about the sun is 365.256 days. The semi major axis of the earth's orbit is 1.495×10^{11} m. In turn the semi major axis of the orbit of Mars is 2.2783×10^{11} m. Calculate the period of Mars. (04 Marks)

PART - B

- 5
 - a. With the help of neat sketch, explain the semi monologue fuselage construction. (06 Marks)
 - b. State the function of i) Aircraft skin ii) Ribs and frames iii) Span iv) Bulkhead v) Stringers vi) Aileron. (12 Marks)
 - c. What are the most common metals used in aircraft construction? (02 Marks)
- 6
 - a. With a neat sketch, explain in detail about turbojet engine. (08 Marks)
 - b. State the advantages of the Turboprop over the turbojet engine. (04 Marks)
 - c. Describe the principle of operation of rocket. (08 Marks)
- 7
 - a. Describe Pneumatic system of an airplane and list various applications of pneumatic system. (10 Marks)
 - b. What is purpose of aircraft fuel system? Describe any one fuel system with simple sketch. (10 Marks)
- 8
 - a. What is meant by flight control system? (02 Marks)
 - b. What are the different types of flight control system? Discuss in detail. (08 Marks)
 - c. Explain in detail about aircraft instruments. (10 Marks)

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.