

CBCS Scheme

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15AE32

Third Semester B.E. Degree Examination, June/July 2017

Elements of Aeronautics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Write a short note on Aircraft Axes system with Relevant figure. (06 Marks)
- b. Explain with neat sketch, the principle operation of Helicopter and their functions. (10 Marks)

OR

- 2 a. Explain with neat sketch Monocoque, semi Monocoque and Tress structure of Aircraft. (08 Marks)
- b. Explain in detail with application metallic and Non-metallic materials used in Aircrafts. (08 Marks)

Module-2

- 3 a. Define with equation speed of sound. Explain its significance in determining airspeed and ground speed. (06 Marks)
- b. Define the terms Aerodynamic centre, Aspect Ratio and Mach number with relevant equations. (06 Marks)
- c. With a neat sketch define Nomenclature of Assymetric Aerofoil. (04 Marks)

OR

- 4 a. Derive Bernoulli's equation and explain its significance in generation of lift and measuring Airspeed. (06 Marks)
- b. An aircraft carries 40,000 lbs, wing area of 350ft^2 and wing span of 50ft. At sea level the aircraft flies at 200 and 600ft/sec. what are the values of induced drag and total drag co-efficient? Also calculate co-efficient of lift when lift = weight. Assume $e = 0.85$. (10 Marks)

Module-3

- 5 a. What is aircraft power plant? Write the classification of Aircraft power plant in brief. (06 Marks)
- b. With a neat sketch explain 'Turbofan' Engine and explain about Bypass ratio and its significance. (10 Marks)

OR

- 6 a. With a neat sketch explain 'Brayton cycle' and its application in Jet engines. (08 Marks)
- b. What is thrust Augmentation? Explain different thrust Augmentation methods. (08 Marks)

Module-4

- 7 a. With a neat sketch explain conditions of static and dynamic stability of an Aircraft. (08 Marks)
- b. With a neat sketch explain contribution of control surfaces in maintain Aircraft stability and control. (08 Marks)

OR

- 8 a. Explain with a characteristic chart effect of power and altitude on performance of the aircraft. (08 Marks)
- b. Explain with neat sketch inverted maneuvers of Aircraft. (08 Marks)

Module-5

- 9 a. With the help of Block diagram, explain Aircraft electrical Generation and distribution system. (08 Marks)
- b. Explain Aircraft 'Navigation' system. List the components which Guides the Aircraft during flight. (08 Marks)

OR

- 10 a. Draw the neat block diagram of Aircraft Pneumatic system and explain it. (08 Marks)
- b. Write a short note on :
- i) Aircraft oxygen system
 - ii) Environmental control system. (08 Marks)

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