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BAS-009

B. TECH. (AEROSPACE ENGINEERING) (BTAE)

Term-End Examination

June, 2019

BAS-009 : INTRODUCTION TO AERONAUTICS

Time : 3 Hours *Maximum Marks : 70*

Note : Attempt any ***seven*** questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a) Discuss the salient features of Wright Flyer with the help of a neat sketch. 7

   (b) Define lift and drag. 3

2. Show various components of an aircraft including fixed and control surfaces with the help of three views of labelled aircraft. Explain the working of primary control surface. 10

3. (a) Differentiate between airplane and helicopter. 5

   (b) Write a note on V/STOL machines. 5

4. Define the following terms : 5×=2=10

   (a) Absolute altitude

   (b) Absolute ceiling

   (c) Absolute angle of attack

   (d) Aerodynamic center

   (e) Aerodynamic twist

5. Explain the nomenclature of the following NACA airfoil series : 3+3+4=10

   (a) NACA 4-digit series

   (b) NACA 5-digit series

   (c) NACA 6-digit series

6. Explain the following types of drag : 5×2=10

   (a) Form drag

   (b) Parasite drag

   (c) Interference drag

   (d) Zero lift drag

   (e) Induced drag

7. Differentiate between turbojet and turbofan engine. Explain the working of a turbofan engine with the help of a neat and labelled diagram. Also write thrust equation. 10

8. Explain the following : 5×2=10

   (a) Stalling speed

   (b) Minimum control speed

(c) Decision speed

(d) Minimum unstuck speed

(e) Balanced field length

9. Write short notes on the following : 5+5=10

(a) Flight envelope (using diagram)

(b) Endurance and derivation of expression for endurance