No. of Printed Pages : 2

BAS-009

B.Tech. AEROSPACE ENGINEERING (BTAE)

Term-End Examination

00078

June, 2015

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) Explain the features of Wright Flyer with the help of neat sketches. *5*

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

2. (a) Draw the top view and side view of a conventional aircraft showing various components. Also label the components. *5*

(b) Distinguish between primary and secondary control surfaces. How is control achieved through primary control surfaces ? *5*

3. Explain V-n diagram of a typical fighter aircraft with the help of a neat sketch. *10*

4. What is the importance of standard atmosphere ? Calculate the standard atmosphere values of pressure, density and temperature at an altitude of 19 km. Use lapse rate of – 6·5 K/km for the gradient region. *10*

5. Explain the working principle of an altimeter with the help of a neat sketch. *10*

6. Define the following : *5×2=10*

   (a) Critical Mach Number

   (b) Laminar Airfoil

   (c) Equivalent Airspeed

   (d) Pressure Altitude

   (e) Service Ceiling

7. How do propellers produce forward thrust ? Explain various types of propellers used in aircrafts. *10*

8. (a) Explain Drag Polar with the help of a sketch. *4*

   (b) What are high-lift devices ? List and explain the functioning of various high-lift devices. *6*

9. Explain the effect of the following on airplane performance : *4+3+3=10*

   (a) Sweep back

   (b) Aspect ratio

   (c) Wing tips