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BAS-023

B.Tech. AEROSPACE ENGINEERING (BTAE)

Term-End Examination

00521

June, 2019

BAS-023 : AIRCRAFT DESIGN / LAUNCH VEHICLE / ROCKET DESIGN

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 purpose of ailerons. Also explain how this purpose is achieved. *5*

(b) What is collective pitch and pitch of the propeller ? *5*

2. Discuss in detail, the determination of take-off weight of an aircraft. *10*

3. What is the function of a tail in the aircraft ? Draw different kinds of tail arrangements commonly used in airplanes, clearly describing the merits and demerits of each. *10*

4. Explain the following :

   (a) Wing Area (Estimation) *5*

   (b) Wing Span and Aspect Ratio *5*

5. Describe in detail, three types of conventional landing gear systems. *10*

6. (a) Explain minimum four aerodynamic properties taken into consideration while designing an aircraft. *5*

   (b) What is wing loading ? How is it calculated ? *5*

7. With the help of sketches and plots, illustrate the structural layout details of an all metal wing and explain torsional and divergence moments. *10*

8. (a) Discuss the function of a trim tab in an aircraft. *5*

   (b) Why is the use of $(L/D)_{max}$ optimistic ? *5*

9. What is a propeller ? Enumerate different types of propellers. What is meant by feathering of propellers ? *10*