

**B.Tech. AEROSPACE ENGINEERING
(BTAE)**

Term-End Examination

00273

June, 2018

**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. What is the effect on the following in the performance of an airfoil ? 5×2=10
 - (a) Thickness to Chord Ratio (t/c)
 - (b) Maximum Thickness
 - (c) Location of Maximum Thickness
 - (d) Leading Edge Radius
 - (e) Location of Maximum Camber

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

3. Discuss in detail, the determination of take-off weight of an aircraft. 10
 4. Describe in detail an Airplane Design Tree. 10
 5. Derive the expression for radius of turn and critical velocity of an aircraft. 10
 6. What is a centrifugal compressor and what are its advantages ? With a neat sketch explain the essential parts of a centrifugal compressor. 10
 7. Differentiate between the following in brief : $2 \times 5 = 10$
 - (a) High wing and Low wing airplane configuration
 - (b) Dihedral wings and Anhedral wings
 8. What are the properties of Titanium which lead it to be widely used to produce airframe structural components ? 10
 9. Explain the factors which influence the wing design. 10
 10. Describe in brief the methodology and considerations for the selection of propulsion system for a fighter aircraft. 10
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