

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, Dec 2021

Course: Introduction to Aerospace & Avionics Engineering

Semester: III

Program: B.Tech, ASE/ASE+AVE

Time 03 hrs.

Course Code: ASEG 2004

Max. Marks: 100

Instructions: All questions are compulsory, Make use of sketches wherever required.

SECTION A

S. No.	Question	Marks	CO
Q1.	What is the contribution of Sir George Cayley in the history of Aviation?	4	CO1
Q2.	How are different types of Aircrafts classified? Explain Amphibians and Sea plane	4	CO1
Q3.	State the advantage and disadvantage of Solid propellant and liquid propellant	4	CO4
Q4.	How does Serial and Parallel Staging rockets works. Explain the advantages of Staging	4	CO4
Q5.	Draw a neat sketch of Ramjet and Scramjet Engine and briefly explain the difference between them.	4	CO4

SECTION B

Q6.	Define the following in relation to lighter-than-Air Aircraft a) Aerostat b) Airship c) Free Balloons d) Kite Blloons	10	CO1
Q7	Explain the following a) Washin and Wash out b) Geometric Twist and Aerodynamic Twist c) Conventional control, and Powered controls d) Supersonic and hypersonic flow	10	CO2
Q8	Describe the various components of Jet Engine and discuss the mechanism of thrust production for Jet Engine.	10	CO4
Q9	Explain about the Air Speed Indicator and Altimeter Purpose and its Construction Details?	10	CO3

SECTION-C

Q 10	The international standard atmosphere (ISA) exists to allow designers to use a consistent definition of the atmosphere. The ISA defines the regions of the atmosphere. It also defines how the important properties of air change in each		CO2
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	<p>of these regions.</p> <p>(a) What is the name of the third of the four regions of the atmosphere, starting at the surface of the earth? It is the region about which the least is known as no aircraft fly in it and it is too close to the earth for sustained satellite orbit.</p> <p>(b) In the troposphere, the temperature lapse ratio is -6.5 K/km. What is the temperature at the tropopause?</p> <p>(c) What is the temperature at an altitude of 20 km? This altitude is in the lower stratosphere</p>	<p>5</p> <p>8</p> <p>7</p>	
Q11	<p>Draw a typical Coefficient of lift Vs angle of attack (C_l Vs α) curve and show and explain the effect of Cl and Stalling angle for the following</p> <p>a) Effect of camber – Symmetric , low camber and high camber</p> <p>b) Effect of Aspect Ratio 2D and 3D Wing</p> <p>c) Effect of flap – with and without flap</p> <p>d) Effect on Cl – Basic Airfoil and leading Edge Flap</p> <p>e) Effect on Cl – Basic Airfoil and Slat or Slot</p>	<p>20</p>	<p>CO3</p>