

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
Diploma Aeronautical Engineering, Mid semester Examination

Semester: 6th
Subject Code: 03613351
Subject Name: Introduction to Flight mechanics
Marks: 40

Date: (18/01/2023)
Time: (1hr: 30min)
Total

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered to be Authentic.

Q.1	Answer any six out of Ten. (2 Marks Each)	(12)	CO/PO	Bloom's Taxonomy
	1. Define Absolute Altitude.		CO2	Knowledge
	2. Define Critical Mach number.		CO1	Knowledge
	3. Define Drag Divergence Mach number.		CO1	Knowledge
	4. What is Indicated Airspeed?		CO2	Knowledge
	5. What is True Airspeed?		CO1	Knowledge
	6. What is the Atmosphere?		CO2	Knowledge
	7. Give the name of layer of atmosphere.		CO2	Knowledge
	8. What do you mean by Geometric Altitude.		CO2	Knowledge
	9. Define Geo-potential Altitude.		CO2	Knowledge
	10. Define Calibrated Airspeed.		CO1	Knowledge
Q.2	A) Explain Different types of Atmospheric Layers with diagram.	(03)	CO2	Understand
	OR			
	A) Described function of Aileron.	(03)	CO3	Evaluate
	B) Prove that for steady level Flight $L=W$ and $T=D$.	(03)	CO3	Evaluate
	OR			
	B) Draw C_l vs C_d graph for airfoil.	(03)	CO3	Create
	C) Described Stratosphere in details.	(04)	CO2	Evaluate
	OR			
	C) Prove that minimum Thrust required condition for Steady level Flight is $C_{D,0} = C_{D,i}$	(04)	CO3	Evaluate
	D) Draw temperature vs. Altitude Graph for International Std Atmosphere (ISA).	(04)	CO2	Create
Q.3	A) Short note on Swept back wing.	(03)	CO1	Analyze
	OR			
	A) Define Range of an Aircraft.	(03)	CO3	Knowledge
	B) Explain function of Rudder.	(03)	CO3	Understand
	OR			
	B) Define Center of pressure of aircraft.	(03)	CO2	Knowledge
	C) Derive Relation between Geopotential altitude & Geometric altitude.	(04)	CO2	Apply
	OR			
	C) Calculate the std Atmosphere value of Pressure, Temperature and Density at an altitude of 7500m from Mean Sea Level. At MSL, $P = 1.01 \times 10^5 \text{ N/m}^2$, ρ	(04)	CO2	Apply

= 1.23kg/m ³ , T = 288 K.			
D) Short note on Drag Polar.	(04)	CO3	Analyze