Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3170104 Date:16-01-2023

Subject Name:Rocket and Missile Technology

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Illustrate with proper equations "Flat Turns for maneuvering flight".	**03**
	(b)	Explain air to surface missile with neat sketch.	**04**
	(c)	Draw and explain typical base Pressure vs Mach number graph.	**07**
Q.2	**(a)**	Compare between Rocket and Missile with appropriate points.	**03**
	(b)	Derive equation of velocity of propagation of pressure pulse line.	**04**
	(c)	Explain steps of graphical method for straight & level flight trajectory.	**07**
		OR	
	(c)	What is purpose propellant loading tolerance? Explain its major consideration	**07**
Q.3	**(a)**	Differentiate Liquid and Cryogenic propellants.	**03**
	(b)	Explain desirable physical properties: 1.stability 2. Pumping properties for liquid propellant.	**04**
	(c)	Explain double base propellant.	**07**
		OR	
Q.3	**(a)**	Discuss solid propellant Grain design.	**03**
	(b)	What is the difference between Gelled and Cryogenic propellant?	**04**
	(c)	Explain usable Propellant for Propellant Inventory.	**07**
Q.4	**(a)**	What are the different types of Missiles?	**03**
	(b)	Define Aspect Ratio with appropriate sketches.	**04**
	(c)	Explain Propellant feed lines.	**07**
		OR	
Q.4	**(a)**	What is nose fineness ratio? Explain steps to design Power series noses.	**03**
	(b)	What are the various wing planforms?	**04**
	(c)	Explain the functions of components of Missile.	**07**
Q.5	**(a)**	Which are the different causes to form pressure loss in missile?	**03**
	(b)	What are parallel and normal forces acting on Rocket/Missile?	**04**
	(c)	Explain Ackeret/Linearized Theory.	**07**
		OR	
Q.5	**(a)**	List out different types of Drag.	**03**
	(b)	What are the benefits of Mid sections?	**04**
	(c)	Write a short note on Propellant tank outlet design with neat sketch.	**07**

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