Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code:3170209 Date:20-11-2025

Subject Name:Automotive Aerodynamics and Aesthetics

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)**	Define aerodynamic drag. Explain pressure drag.	**03**
	(b)	What is the importance of aerodynamics in a vehicle?	**04**
	(c)	Give the types of wind tunnel and explain the wind tunnel testing with neat sketch	**07**
Q.2	**(a)**	Define aerodynamics aesthetics.	**03**
	(b)	Explain SAE aerodynamics axis system with neat sketch.	**04**
	(c)	Enlist different methods for drag reduction and explain anyone.	**07**
		OR	
	(c)	Explain drag coefficient with various body shapes.	**07**
Q.3	**(a)**	Give the advantages of closed wind tunnel over open wind tunnel.	**03**
	(b)	Write a short note on mechanics of air flow and pressure around vehicle.	**04**
	(c)	Explain technical criteria for aesthetic design of exterior and interior of an automotive.	**07**
		OR	
Q.3	**(a)**	Discuss about the effects of rear end spoiler.	**03**
	(b)	What are the importance of deflector used over the truck's cabin with aerodynamics?	**04**
	(c)	Explain any one method used for shape optimization of car.	**07**
Q.4	**(a)**	Define underbody roughness.	**03**
	(b)	Discuss principles of commercial vehicle aerodynamics.	**04**
	(c)	List out the aerodynamics forces and explain each in brief.	**07**
		OR	
Q.4	**(a)**	Define yaw angle and its importance.	**03**
	(b)	Enlist On- road testing and measurement methods.	**04**
	(c)	Write a short note on Cab roof deflectors.	**07**
Q.5	**(a)**	Define clay modeling.	**03**
	(b)	Discuss about divergent and convergent collector in wind tunnel	**04**
	(c)	Write a short note on Flow visualization scale model testing with neat sketch..	**07**

OR

Q.5	**(a)**	Define Full sized tape drawing.	**03**
	(b)	Write a short note on digital aesthetic design process.	**04**
	(c)	Explain importance of aerodynamics in vehicle for better performance.	**07**

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