

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3170209****Date: 26/06/2023****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) Explain SAE aerodynamics axis system with neat sketch	03
	(b) Define aerodynamic drag. Explain pressure drag.	04
	(c) Explain pressure distribution above and below the body structure with neat sketch.	07
Q.2	(a) Explain Lamina and turbulent air flow.	03
	(b) Define vehicle lift and compare negative lift with positive lift.	04
	(c) Derive a formula for calculating the opposing resistance of a body passing through the air.	07
	OR	
	(c) Write short note on drag coefficient with various body shapes.	07
Q.3	(a) Explain Corner Vanes.	03
	(b) Discuss vortices with its different structure	04
	(c) Explain dust flow patterns at the rear in Automotive.	07
	OR	
Q.3	(a) Explain advantages of use a deflector over the truck's cabin.	03
	(b) Discuss the effect of rear panel slope angle on the afterbody drag.	04
	(c) Explain with neat sketch different types of wind tunnels.	07
Q.4	(a) Explain crosswind test.	03
	(b) Discuss rear end spoiler for lift control.	04
	(c) Write a short note on- road measurement of the wind noise.	07
	OR	
Q.4	(a) Explain cab roof deflector.	03
	(b) Explain Tractor and trailer skirting.	04
	(c) Write short note on cab to trailer body gap seals with neat sketch.	07
Q.5	(a) Explain Clay Modelling.	03
	(b) Explain Digital aesthetic design process.	04
	(c) Write short note on technical criteria for aesthetic design of exterior and interior of an automotive.	07
	OR	
Q.5	(a) Explain principle of commercial vehicle aerodynamics.	03
	(b) Compare various devices used to reduce vehicle drag.	04
	(c) Write a short note on Flow visualization scale model testing with neat sketch.	07
