

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2170203

Date:10/05/2019

Subject Name:Vehicle Dynamics

Time:02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define (i) Lift (ii) Drag.	03
	(b) Explain SAE Vehicle axis.	04
	(c) Derive an equation to calculate the dynamic axial load for the following condition (i) Vehicle is on ground (ii) Vehicle is in low speed acceleration (iii) vehicle is on grade.	07
Q.2	(a) Define (i) Slip angle (ii) Camber thrust.	03
	(b) Describe about aerodynamic aids.	04
	(c) Classify types of tyres with neat sketch along with their advantages and disadvantages.	07
	OR	
	(c) Define rolling resistance. Explain factors affecting rolling resistance.	07
Q.3	(a) Define active suspension.	03
	(b) Explain anti-dive suspension geometry.	04
	(c) Illustrate about roll center analysis.	07
	OR	
Q.3	(a) Justify need of suspension system.	03
	(b) Distinguish independent suspension and dependent suspension.	04
	(c) Classify types of suspension systems along with pro and cons of each.	07
Q.4	(a) Explain height of motorcycles center of gravity.	03
	(b) Define wheelbase and steering axis angle of motorcycle.	04
	(c) Explain Quasi-static rollover of a rigid vehicle.	07
	OR	
Q.4	(a) Justify importance of trail.	03
	(b) Define fork offset and wheel flop of motorcycle.	04
	(c) Explain Quasi-static rollover of a suspended vehicle.	07
Q.5	(a) Define (i) Camber (ii) Under steer (iii) Over steer	03
	(b) Differentiate between steering system used in front wheel drive system and steering system used in rear wheel drive vehicle.	04
	(c) Justify need of steering system. Explain steering geometry errors.	07
	OR	
Q.5	(a) Define (i) Caster (ii) Neutral steer (iii) Wheelbase	03
	(b) Explain four wheel steering system.	04
	(c) Explain steering system forces and moments.	07
