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 cones 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**

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