Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (OLD) EXAMINATION – WINTER 2018

Subject Code: 170203 **Date: 26/11/2018**

Subject Name: Vehicle Dynamics

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.**

Q.1	**(a)**	Define following vehicle dynamic terminologies. 1. Euler angles 2. Camber thrust 3. Brake factor 4. Soft and Hard suspension 5. Slip angle 6. Understeer and Oversteer 7. Roll Steer	**07**
	(b)	What is traction limited acceleration? Formulate the equation for maximum traction force of rear wheel drive having solid rear axle with non locking differential.	**07**
Q.2	**(a)**	With the help of road performance curve explain acceleration, gradability and drawbar pull.	**07**
	(b)	Derive the equation to calculate the dynamic axle load for the following condition of four wheeler. i) When the vehicle on level ground under static condition. ii) When the vehicle on grads with low speed acceleration.	**07**
		OR	
	(b)	Illustrate tire print and hydroplaning phenomena.	**07**
Q.3	**(a)**	Explain Lumped mass and Euler angles.	**07**
	(b)	Explain Anti lock Brake system.	**07**
		OR	
Q.3	**(a)**	Explain Vehicle aerodynamics forces.	**07**
	(b)	Define Roll center and roll axis. Locate the roll center for the following suspension mechanism. 1) Hotchkiss suspension. 2) Positive swing arm independent suspension. 3) Macpherson strut suspension. 4) Four link rear solid axle suspension.	**07**
Q.4	**(a)**	Explain : Brake factor, Brake proportioning and Braking efficiency	**07**
	(b)	What is braking coefficient? Explain the parameters which affect braking coefficients.	**07**
		OR	
Q.4	**(a)**	Explain: How the vehicle ride performance can be improved by semi or active suspensions?	**07**
	(b)	Explain all the factors of ride comfort.	**07**
Q.5	**(a)**	Explain: How the vehicle ride performance can be improved by semi or active suspensions?	**07**
	(b)	Explain Vehicle drag components.	**07**
		OR	
Q.5	**(a)**	Explain Vehicle aerodynamics forces.	**07**
	(b)	Explain: How four wheel steering system improve low speed maneuverability and high speed cornering?	**07**

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