Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 170203 **Date: 09/06/2012**

Subject Name: Vehicle Dynamics

Time: 02:30 pm – 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.**

Q.1	**(a)**	Describe arbitrary forces acting on vehicle with sketch. Explain (i) Static loads on Level Ground (ii) Low Speed Acceleration (iii) Loads on Grades	**07**
	(b)	Differentiate between front wheel and rear wheel drive.	**07**
Q.2	**(a)**	Discuss parameters like vertical load, inflation pressure, slip angle, tire type and tread design on performance of tire.	**07**
	(b)	Compare the performance characteristics of petrol and diesel engine and derive expression for powered limited acceleration.	**07**
		OR	
	(b)	Describe Bias ply tire and Radial-ply tire with neat sketch.	**07**
Q.3	**(a)**	Discuss following terms: (i) Rolling Resistance (ii) Road Grade (iii) Brake factor (iv) Deceleration with wind resistance.	**07**
	(b)	Discuss phenomenon of rear wheel lockup.	**07**
		OR	
Q.3	**(a)**	Discuss any three independent suspension systems briefly.	**07**
	(b)	Explain with neat sketch positive swing arm geometry and negative swing arm geometry.	**07**
Q.4	**(a)**	Explain steering geometry error with sketches.	**07**
	(b)	Explain the terms (i) Steering ratio (ii) Under-steer.	**07**
		OR	
Q.4	**(a)**	Define following terms: (i) Drag Co-efficient (ii) Lift force (iii) Yawing Moment (iv) Pitching Moment	**07**
	(b)	Discuss any three factors affecting fuel economy.	**07**
Q.5	**(a)**	Discuss the effect of Road Roughness on vehicle vibration during ride.	**07**
	(b)	Explain twin tube and mono tube type shock absorber .	**07**
		OR	
Q.5	**(a)**	Explain cornering equation with respect to bicycle model and derive the equation of steer angle.	**07**
	(b)	Discuss the suspension effect due to chamber change on cornering.	**07**

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