

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. **07**
Explain (i) Static loads on Level Ground (ii) Low Speed Acceleration (iii) Loads on Grades

(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: **07**

(i) Rolling Resistance (ii) Road Grade (iii) Brake factor
(iv) Deceleration with wind resistance.

(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**
