

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 170203****Date: 04-12-2014****Subject Name: Vehicle Dynamics****Time: 10:30 am - 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) Derive the equation to calculate the dynamic axle load for the following **07**
Condition of four wheeler.
i) When the vehicle on level ground under static condition.
ii) When the vehicle on grads with low speed acceleration.
- (b) Explain vehicle fixed co-ordinate system with neat sketch. **07**
- Q.2** (a) Explain camber thrust and aligning moment. **07**
(b) Explain slip angle, inflation pressure and tread design. **07**
- OR**
- (b) Explain power limited acceleration based on engines. **07**
- Q.3** (a) Explain different cases of braking forces. **07**
(b) Explain anti-lock braking system with neat sketch. **07**
- OR**
- Q.3** (a) Explain Aerodynamics forces. **07**
(b) Explain total road loads and effect of road loads on fuel economy. **07**
- Q.4** (a) Explain roll centre analysis. **07**
(b) Explain under steer and over steer. **07**
- OR**
- Q.4** (a) Explain equivalent trailing arm analysis. **07**
(b) Explain shimmy and wobble effect of steering system. **07**
- Q.5** (a) Explain different factors affecting rolling resistance. **07**
(b) Explain suspension isolation and suspension stiffness. **07**
- OR**
- Q.5** (a) Explain yaw velocity gain and side slip angle. **07**
(b) Explain tire cornering forces with neat sketch. **07**
