

GUJARAT TECHNOLOGICAL UNIVERSITY**ME - SEMESTER- I (OLD course) • EXAMINATION – SUMMER 2015****Subject Code: 711308****Date: 16/05/2015****Subject Name: Highway Geometric Design****Time: 10:30 am to 1:00 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) What are the factors controlling the alignment of roads? Explain any two of them in detail. **07**
- (b) Explain total reaction time of driver and the factors on which it depends. **07**
Explain ϕ PIEV ϕ theory with a neat sketch.
- Q.2** (a) Describe the classification system of urban highways in India. **07**
- (b) What is the importance of super elevation on horizontal curve? Derive an expression for calculating super elevation. **07**
- OR**
- (b) What is the difference between slip and skid? Explain various factors affecting friction between pavement surface and tyre. **07**
- Q.3** (a) Explain various principles of intersection design for safety of traffic. **07**
- (b) Explain the merits of transition curve in the highway. Enlist the methods of setting out transition curve in the field. **07**
- OR**
- Q.3** (a) What are the general controls to be kept in mind in designing vertical profile of a road? **07**
- (b) Describe with sketches the various types of grade separated intersections and the conditions under which they are adopted? **07**
- Q.4** (a) Explain compensation in gradient on horizontal curves. **07**
- (b) What are the objectives of channelization? Discuss the various features of channelization. Explain with the help of neat sketches. **07**
- OR**
- Q.4** (a) Write short note on extra widening of pavements. **07**
- (b) Derive an expression for finding the stopping sight distance at level and at grades. **07**
- Q.5** (a) Derive a formula determining the length of a sag curve for fulfilling rider comfort criterion. **07**
- (b) The speeds of overtaking and overtaken vehicle are 80 and 60 kmph respectively. If the acceleration of the overtaking vehicle is 2.5 kmph per second, Calculate the overtaking sight distance for two way traffic. **07**
- OR**
- Q.5** (a) What is the function of camber in a road surface? What is the recommended value of camber for various types of surfaces? **07**
- (b) A two-lane (7m wide) pavement on a National Highway has a curve of radius 400m. Determine the length of transition curve making suitable assumptions. **07**
