

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2150601****Date: 17/06/2019****Subject Name: Highway Engineering****Time: 02:30 PM TO 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) What is the width of carriageway? **03**
 (b) What is road safety audit? **04**
 (c) Classify road patterns with sketch. **07**
- Q.2** (a) Write in brief about street lighting. **03**
 (b) Which factors are considered for the design of pavements? **04**
 (c) Discuss about failures in flexible and rigid pavements. **07**
- OR**
- (c) Discuss about road drainage with sketch and significance. **07**
- Q.3** (a) List basic tests for bitumen as highway construction material. **03**
 (b) What are the desirable properties of good bituminous mix? **04**
 (c) What is the difference between flexible and rigid pavement? Discuss about pavement components with sketch. **07**
- OR**
- Q.3** (a) List basic tests for coarse aggregate as highway construction material. **03**
 (b) What are the desirable properties of soil as highway construction material? **04**
 (c) What is GI? Explain CBR method of pavement design with limitations of the method. **07**
- Q.4** (a) Calculate superelevation required for a concrete road 7.5 m wide on a curve of 800 m radius at a design speed of 50 kmph. **03**
 (b) Sketch highway cross section on embankment showing elements on it. **04**
 (c) What is Stopping and overtaking sight distance? Calculate the minimum stopping sight distance on a highway at a descending gradient of 6%. Design speed is 80 kmph. Reaction time of driver is 2.5 seconds. Coefficient of friction between tyre and road surface is 0.4. **07**
- OR**
- Q.4** (a) Find the total widening required for a four lane highway on a horizontal curve of radius 400 m. The design speed of highway is 80 kmph and the length of longest base of vehicle expected on the highway is 7.0m. **03**
 (b) What is gradient? What are the types of it? **04**
 (c) What are the types of curves provided in highway? Explain in detail about transition curve along with determination of length of curve and types of transition curve. **07**
- Q.5** (a) What are the preventive measures of accident? **03**
 (b) What are the types of traffic signs? **04**
 (c) Explain traffic flow characteristics with relationship plots/sketches among traffic flow parameters. **07**
- OR**
- Q.5** (a) What are the types of parking? **03**
 (b) What are the types of intersection? **04**
 (c) Discuss about roaduser characteristics. **07**
