

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2017

Subject Code: 2150601

Date: 28/11/2017

Subject Name: Highway Engineering

Time: 10:30 AM TO 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 an expression for calculating stopping sight distance on a highway. **03**
(b) What is traffic engineering? Explain vehicular characteristics in detail. **04**
(c) Explain briefly modified classification of road system in India as per third twenty year road development plan. **07**
- Q.2** (a) Explain the term traffic volume. What are the objectives of traffic volume studies? **03**
(b) What is camber? What are the objects of camber? Sketch different types of camber. **04**
(c) Enlist different tests for aggregates and describe abrasion test in brief. **07**
- OR**
- (c) Enlist different tests for bitumen and explain ductility test in brief. **07**
- Q.3** (a) Write a short note on road safety audit. **03**
(b) Discuss soil classification based on grain size. **04**
(c) What is traffic control devices? Discuss road signs in brief with neat sketches. **07**
- OR**
- Q.3** (a) Discuss various factors to be considered in pavement design. **03**
(b) What are the causes of road accidents? Discuss preventive measures of accidents. **04**
(c) Discuss about traffic islands and types of intersections. **07**
- Q.4** (a) What is gradient? Explain various types of gradients in brief. **03**
(b) The area of a district in India is 13400 sq. km. and there are 12 towns as per 1981 census. Determine length of different categories of roads to be provided in this district by 2001. **04**
(c) Enlist the component parts of road pavement with neat sketch. Explain each component of road pavement in detail. **07**
- OR**
- Q.4** (a) Write a short note on obligatory points. **03**
(b) Discuss road arboriculture and street lighting in brief. **04**
(c) The design speed of highway is 80 kmph. There is a horizontal curve of radius 200 m on a certain locality. Calculate super elevation needed to maintain this speed. If maximum super elevation of 0.07 is not to be exceeded, calculate maximum allowable speed on this horizontal curve as it is not possible to increase the radius. Safe limit of transverse coefficient of friction is 0.15. **07**
- Q.5** (a) Explain various methods of on street parking. **03**
(b) Discuss the maintenance problems in hill roads. **04**
(c) Discuss about advantages of bituminous roads and maintenance of bituminous surfaces. **07**
- OR**
- Q.5** (a) Explain the necessity of soil investigations. **03**
(b) Calculate extra widening required for a pavement of width 7 m on a horizontal curve of radius 250 m if the longest wheel base of vehicle expected on the road is 7.0 m. Design speed is 70 kmph. **04**
(c) What are the types of road patterns? Explain with neat sketch. **07**
