Seat No.: _____ Enrolment No.

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**

****