Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V • EXAMINATION – WINTER 2016

Subject Code: 150601 **Date: 30/11/2016**
Subject Name: Highway Engineering
Time: 10:30AM – 01:00PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Draw neat sketch / figure where ever necessary**

Q.1	**(a)**	Draw cross section of road showing its components and write functions of each.	**07**
	(b)	Two vehicles are approaching from opposite directions at 100 and 80 kmph. Calculate minimum site distance required to avoid head on collision. Assuming reaction time as 2 sec, coefficient of friction as 0.80 and the brake efficiency is 50 %.	**07**
Q.2	**(a)**	Define road alignment and explain factors affecting road alignment.	**07**
	(b)	What is aerial survey? Write uses of aerial surveys.	**07**
		OR	
	(b)	Write requirements of good alignment.	**07**
Q.3	**(a)**	What are the principles of highway planning?	**07**
	(b)	What is IRC and what are the main functions of IRC ?	**07**
		OR	
Q.3	**(a)**	Explain with sketch “widening of road on curves”.	**07**
	(b)	Calculate extra widening required on curve for a pavement of width 7 m on horizontal curve of radius 300 m. The largest wheel base of vehicle expected on the road is 8.0m. Design speed id 80 kmph.	**07**
Q.4	**(a)**	Draw plasticity chart and explain classification of fine grained soil using plasticity chart.	**07**
	(b)	Write note on “Group Index of soil”	**07**
		OR	
Q.4	**(a)**	Enlist physical tests on aggregates and narrate procedure for water absorption test of aggregates.	**07**
	(b)	Describe Flash and Fire point test of bitumen.	**07**
Q.5	**(a)**	Explain with sketch various deficiencies in the flexible pavement.	**07**
	(b)	CBR value of sub grade soil is 6 %. Calculate total thickness of a pavement using design formula developed by U.S. corps of highway engineers. Take wheel load = 4100 kg and tyre pressure = 6 kg/cm^2	**07**
		OR	
Q.5	**(a)**	List methods of traffic surveys and explain any one method in detail.	**07**
	(b)	What are the objectives of road side arboriculture?	**07**

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