Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2150601 **Date:21/05/2016**

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 are the advantages and disadvantages of road transport?	**07**
	(b)	Describe the various classifications of roads in India by Nagpur Road Plan.	**07**
Q.2	**(a)**	Briefly explain the various requirements of an ideal highway alignment?	**07**
	(b)	Write short notes on: i. Central Road Fund ii. Central Road Research Institute	**07**
		OR	
	(b)	Explain camber. What are the objects of providing camber? Discuss the factors on which amount of camber depends. Also show the various shapes of camber with the help of neat sketch.	**07**
Q.3	**(a)**	Draw a cross-section of road in embankment showing its all details. Also draw a typical cross section of the road indicating the width of pavement, roadway and land for a divided highway in urban area.	**07**
	(b)	Explain PIEV theory. Derive an expression for finding the stopping sight distance at level and at grades.	**07**
		OR	
Q.3	**(a)**	Derive an expression for calculating the overtaking sight distance on a highway.	**07**
	(b)	Calculate the super-elevation to be provided for a horizontal curve with a radius of 400 m for a design speed of 100 kmph in plain terrain. Comment on the results. What is the co-efficient of lateral friction mobilized if super-elevation is restricted to 0.07?	**07**
Q.4	**(a)**	Explain the desirable properties of aggregate to be used in different types of pavement construction. Enlist the various tests to be conducted on aggregates.	**07**
	(b)	Explain with the help of sketches the requirements of joint filler and sealer. Discuss the desirable properties and the various materials in use.	**07**
		OR	
Q.4	**(a)**	What are the various tests carried out on bitumen? Explain ductility test.	**07**
	(b)	Briefly explain the various types of joints used in the construction of cement concrete pavement with the help of neat sketch.	**07**
Q.5	**(a)**	Explain the various types of failures in flexible pavement and their causes.	**07**
	(b)	What are the significance and requirements of highway drainage system?	**07**
		OR	
Q.5	**(a)**	Explain with sketches how the sub-surface drainage system is provided to lower the water table and control seepage flow.	**07**
	(b)	What are the environmental factors to be considered in planning and development of highways? Which are the points to be considered for road side development and arboriculture?	**07**

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