Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER III–EXAMINATION – WINTER 2015

Subject code: 2731306 **Date: 04/12/2015**

Subject Name: Traffic Flow Theory and Simulation

Time: 2:30 PM to 5:00 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)**	Explain heterogeneous traffic flow in context of developing country and discuss the problems in designing transportation infrastructure.	**07**
	(b)	Describe with the example deterministic and probabilistic model of traffic flow.	**07**
Q.2	**(a)**	Explain the fundamental relationship between headway, speeds, density, spacing and traffic flow.	**07**
	(b)	Explain the fluid flow analogy of Traffic flow model. Describe any traffic flow model which is developed based on the fluid flow analogy.	**07**
		OR	
	(b)	Explain car following model and derive the equation for the same.	**07**
Q.3	**(a)**	List the factors affecting the capacity of roads? What are the capacities of various types of roads as per IRC.	**07**
	(b)	What is shock wave in traffic flow? Discuss with sketch.	**07**
		OR	
Q.3	**(a)**	What is Platoon? Describe platoon diffusion and Boltzmann like behavior.	**07**
	(b)	Explain the stopped delay and travel time delay at signalized intersection. How will you measure both the delays?	**07**
Q.4	**(a)**	Explain average queue length, average waiting time, average time spent in system and probability of N number of entity in the system for M/M/1 queuing model.	**07**
	(b)	Differentiate between Static and Dynamic PCU. Describe how would you obtain both types of PCU?	**07**
		OR	
Q.4	**(a)**	Describe deterministic and stochastic queuing models.	**07**
	(b)	Discuss the criteria for Level of Service of highway section specified in HCM manual.	**07**
Q.5	**(a)**	Write a program that generates random numbers which follow the Poisson distribution.	**07**
	(b)	How will you obtain the capacity and level of service of signalized intersection?	**07**
		OR	
Q.5	**(a)**	Enlist available traffic engineering simulation softwares. Explain any one with its application.	**07**
	(b)	Write a short note on ‘Goodness of Fit Test’.	**07**

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