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

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 731303 **Date: 08/12/2011**

Subject Name: Traffic Flow Theories and Simulation

Time: 10.30 am – 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)**	Describe the procedure to obtain speed, flow and density from the traffic survey.	**07**
	(b)	Describe the procedure to find out the type of distribution of event occurrence.	**07**
Q.2	**(a)**	Explain with the example macroscopic and microscopic traffic flow models.	**07**
	(b)	Explain with the example deterministic and probabilistic model	**07**
		OR	
Q.2	**(a)**	Explain car following model and derive the equation for the car following model.	**07**
	(a)	List the factors affecting the capacity of roads? What are the capacities of various types of roads as per IRC.	**07**
Q.3	**(a)**	Write a program which generates 100 random speeds between 10km./hr. to 80km./hr. and which follows normal distribution.	**07**
	(b)	The traffic flow on a highway is $q_1 = 1800$ *veh./hr.* with speed of $v_1 = 70$*km. /hr*. As the result of an accident, the road is blocked. Vehicle length = 3.33 meters. • What is the wave speed (v_w)? • What is the rate at which the queue grows, in units of vehicles per hour (q)?	**07**
		OR	
Q.3	**(a)**	Write a program which classifies 100 speeds in the difference of 5km./hr. class and give output in form of frequency table.	**07**
	(b)	Differentiate homogeneous and heterogeneous traffic flow.	**07**
Q.4	**(a)**	Describe the methodology to find delay at Intersection.	**07**
	(b)	Describe the methodology to find saturation flow.	**07**
		OR	
Q.4	**(a)**	What is force flow condition? Explain and suggest remedial measures for the same in case of urban roads.	**07**
	(b)	List the Simulation software available for traffic flow modeling. Describe any one in brief and state their advantages and disadvantages in using in Indian conditions.	**07**
Q.5	**(a)**	Explain use of queuing theory in Transportation Engineering. What are the most common queuing models used in Transportation Engineering?	**07**
	(b)	Write short note on Simulation.	**07**
		OR	
Q.5	**(a)**	Explain the fluid flow analogy of traffic flow model.	**07**
	(b)	Write a note on Level of Service in traffic stream.	**07**

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