Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E -IIIrd SEMESTER–EXAMINATION – MAY- 2012

Subject code: 731303 **Date: 10/05/2012**

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)**	What are the types of traffic flow Models? How they are classified?	**07**
	(b)	Explain Car following model.	**07**
Q.2	**(a)**	Explain macroscopic traffic flow models and state its advantages	**07**
	(b)	Prove that the time mean speed is more than space mean speed	**07**
		OR	
	(b)	Explain with the sketch shock-wave theory.	**07**
Q.3	**(a)**	Explain how delay is determined at Intersection. Explain importance of delay to obtain Optimum cycle time at Intersection.	**07**
	(b)	How does the platoon diffusion affect the design of coordinated signals? Explain	**07**
		OR	
Q.3	**(a)**	How do you generate random numbers for the normal distribution? Explain and write a computer program.	**07**
	(b)	What is goodness of fit test? Explain	**07**
Q.4	**(a)**	What is arrival vehicle distribution? How vehicle arrival distribution obtain?	**07**
	(b)	What is calibration and validation of simulation models?	**07**
		OR	
Q.4	**(a)**	What is gap acceptance? Where this principle is used in traffic flow and how?	**07**
	(b)	List the factor affecting capacity of highways. How the level of services is defined in the IRC. Explain? What is design volume of traffic flow and how this is differ than capacity?	**07**
Q.5	**(a)**	Explain average queue length, average waiting time, average time spent in the system and probability of N number of entity in the system for M/M/1 queuing models.	**07**
	(b)	What are the limitations to simulating mix traffic of developing country?	**07**
		OR	
Q.5	**(a)**	At toll collection center it is found that the 180 vehicles arrive per hour and it is required 15 seconds to collect toll for each vehicle. Find out the traffic intensity, average queue length, average waiting time in queue, and average time spent in the system considering M/M/1.	**07**
	(b)	Write short note on Simulation versus modeling	**07**

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