Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-II Examination July 2010

Subject code: 721901

Subject Name: Traffic Flow Theory And Management

Date: 05 / 07 / 2010 **Time: 11.00am – 1.30pm**

Total Marks: 60

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Develop a relationship for average force in 'g's on the driver during impact. **06**

Find out the average force in 'g's on the driver, if a vehicle collides with a rigid barrier at a speed of 80 kmph and total deformation suffered by the driven vehicle is 0.52m. Shall the driver die?

(b) The results of a speed study are given in the form of frequency distribution table. Find the time mean speed and space mean speed. **06**

Speed range	frequency
2-5	1
6-9	4
10-13	0
14-17	7

Q.2 **(a)** Give a schematic development of traffic flow variables through time-space diagram. Explain the utility of time-headways and space-gaps. **06**

(b) Develop an "equation of continuity" of a single lane of traffic flow assuming it to be a conserved system. What is the explanation of this equation? **06**

How do we use the above equation to develop a generalized equation of motion?

OR

(b) The peak hour volume on an expressway at the vicinity of the merging area of an on-ramp was determined to be 1800veh/h.If it is assumed that the arrival of expressway vehicles can be distributed by Poisson distribution, calculate the excepted number of acceptable gaps in one hour. **06**

Q.3 **(a)** If the jam density on the approach is 130veh/mi, determine using Green shield's model, the velocity of stopping wave when the approach signal changes to red. If the density on the approach is 45veh/mi and spacemen speed is 40 mi/h. At the end of the red interval, what length of the approach upstream from the stop line will vehicles are affected if the red interval is 35 sec? **06**

(b) What is the basic premise in functional classification of the circular system? How is a circulation system classified? **06**

OR

Q.3 **(a)** What is a generalized visual –angle model? Give model and explain its applications. **06**

(b) Develop the concept of dilemma-zone and show its location by neat sketch. How can we develop a relationship for amber period (A) such that dilemma - zone can be avoided? **06**

Q.4	**(a)**	State the key objectives of TSM.	**06**
	(b)	Write a short note on advanced traffic management systems (ATMS)	**06**

OR

Q.4	**(a)**	Explain the aspects to the positioning of traffic sign as per IRC.	**06**
	(b)	State the criteria's for site specific choice between a central bus-lane layout and curb bus-lane layout.	**06**
Q.5	**(a)**	Explain with neat figure measures that can be considered for change in equilibrium brought about by transportation system management that reduce demand.	**06**
	(b)	State the goals and objectives for traffic calming for guiding the development of neighborhood traffic management program.	**06**

OR

Q.5	**(a)**	Explain the principles of area traffic management to effectively address problems while minimizing or mitigating any related secondary effects.	**06**
	(b)	State the traffic data of traffic volume and traffic characteristics required to obtain outputs for potential users and suggest the framework for maintaining traffic data on continuous basis.	**06**

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