Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1721901 **Date: 06/07/2012**

Subject Name: Traffic Flow Theory & Management

Time: 10:30 am – 13:00 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)** "The non- uniform acceleration model defines the behavior of an average passenger car". Explain the above statement precisely. **07**

(b) What is the contribution of perchonok to the knowledge of driver behavior and specially driver errors? **07**

Q.2 **(a)** Why "headways and gaps" are called the "building-blocks" of traffic stream. Relate them to volume, density and speed. **07**

(b) Develop suitable traffic flow model for a non-uniform acceleration of three passenger cars: **07**

Car-A	Car-B	Car-C
Maximum acceleration=1.5 m/s^2 Max. Speed =85 kmph.	Maximum acceleration=1.75 m/s^2 Max. Speed =90 kmph.	Maximum acceleration=2.0 m/s^2 Max. Speed =80 kmph.

What is the rate of acceleration after 4 seconds of an instant when all of three cars moving at 60 kmph.

OR

(b) Explain Visual -Angle model of driver response in Traffic flow .Give the models and explain its applications. **07**

Q.3 **(a)** 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? **07**

(b) Drivers with an average 20/40 vision travel at 55mph in curb lane of a freeway, Where the exit ramps are designed for 25mph.What be the minimum distance of signs with 6-in.letters placed ahead of the exit? The facts are provided: perception-reaction time=2.5sec; deceleration rate=5 ft/sec2; the pavement is on a 1% downgrade; drivers with 20/20 vision can read signs at 60 ft per inch of letter height. **07**

OR

Q.3 **(a)** An alert driver (with a reaction time 0.5 seconds) is driving downhill on 4% grade at 35mph on a dry pavement when suddenly a person steps from behind a parked car in the path of driver, at a distance of 125ft. **07**

(i) Can driver stop in time with emergency braking assuming deceleration rate of 14.8ft/s?

(ii) Can driver stop in time on a rainy day with comfortable backing assuming a deceleration rate of 11.2ft/s?

(b) Briefly Explain Principles of system-optimization. **07**

Q.4 **(a)** Explain briefly tidal flow operation and principle of it which needs to be translated in practice **07**

(b) Define: parking accumulation ,parking load, parking duration, parking **07**

turnover ,parking space hour, parking deficiency and parking volume

OR

Q.4 **(a)** Write a short note on road delineators. **07**

(b) The parking survey data from a lot by license plate method is given in below table .Find the average occupancy, average turnover, parking load, parking capacity and efficiency of parking lot. **07**

Bay	Time			
	0-15	15-30	30-45	45-60
1	1500	1500	4023	-
2	1254	1255	1256	1255
3	3214	3216	3216	3214
4	-	-	3100	3100
5	1622	1624	1623	-
6	2203	2206	-	-

Q.5 **(a)** Enlist the objective of TSM action. **07**

(b) Explain with neat sketches all the effective devices of implementation for traffic calming. **07**

OR

Q.5 **(a)** State to explain the thresholds for traffic volume and speeds and measures to control it along the entire network of city road. **07**

(b) State to explain a convenient way to examine transportation system management strategies to describe the problems, applications and evaluation factors for travel on freeway shoulders **07**

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