Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1721901 **Date: 16-06-2014**

Subject Name: Traffic Flow Theory and Management

Time: 02:30 pm - 05:00 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)** How the following relations connected or independent? Explain **07**

$$A = (\frac{D_b + W + L}{V_0} + T); \mathrm{D}_b = \frac{V_0^2}{250(f \pm G)}$$

Explain the above relationships ,also ,with individual symbol significance etc.

(b) Explain the perchonokôs approach of driver errors, define the type with examples. **07**

Q.2 **(a)** What is visual-angle model of driverôs response in traffic flow? **07**

(b) A vehicle initially traveling at 88kmph skids to a stop on a 3% downgrade, where the pavement surface provides a coefficient of friction equal to 0.3. How far does the vehicle travel before coming to a stop? **07**

OR

(b) Calculate the stopping side distance for a road for which the design speed is 30mph.The coefficient of friction between the road surface and tires maybe taken as 0. 4 and the reaction time of the driver maybe assumed as 3s.The roadway is levelled and the brake efficiency is 40%. **07**

Q.3 **(a)** Explain macroscopic models of traffic flow. **07**

(b) A motorist traveling at 80kmph o a freeway intends to leave the roadway using an exit ramp with the maximum allowable speed of 50kmph.At what point should the driver step on her brakes to reduce her speed to the rampôs speed limit as she enters the ramp? Assume the coefficient of friction is 0.3 and the alignment of the road is horizontal. **07**

OR

Q.3 **(a)** The speed-density relationship of traffic on section of a freeway lane was estimated to be: $v_x = 16.2\ln(240/k)$. **07**

(i) What is the maximum flow, speed, and density at this flow?

(ii) What is the jam density?

(b) During a 60-sec period, a detector is occupied by vehicles for the following times:0.34,0.38,0.40,0.32,and 0.52sec.Estimate the values of q, k, and v(assume that the loop-detector is 10ft and that the average length of vehicles is 20ft) **07**

Q.4 **(a)** State the basic objectives of TSM and their criteriaôs. **07**

(b). Explain briefly the well-known traffic management measures of restrictions adopted for turning movements. **07**

OR

Q.4 **(a)** State the merits and demerits of closing side streets from traffic management point of view. **07**

(b) With neat diagram, explain the measures that can be considered as effecting demand reduction. **07**

Q.5 **(a)** Write a short note an advanced traffic management systems. **07**

	(b)	State to explain, the three major types of traffic problems that plague residential neighborhoods.	**07**

OR

Q.5	**(a)**	Explain briefly, the types of projects which need to be considered for making high impact alterations to the roadway and adjacent parcels of land.	**07**
	(b)	State the outputs and potential uses of traffic volume data and another of commodity flow (O-D pattern).	**07**

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