Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 711902N

Subject Name: Traffic Engineering & Field Studies

Date: 01 /02 /2011 **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)** (i) Give definition of Traffic engineering. Explain the areas of transportation included or excluded in the definition. **07**

(ii) Enlist and explain factors affecting spot speed on roadways.

(b) Analyze the following spot speed data for various statistical parameters. Give graphical and tabular representation of results. The speed data is as given below: **07**

40	35	49	35
60	28	65	22
40	22	64	30
54	24	66	66
44	30	75	73
30	46	78	79
43	53	70	52
56	42	73	42
35	65	54	56
55	35	69	53
63	38	74	63

Q.2 **(a)** What is the time based classification of traffic volume counts? Enlist the uses of each class of volume counts. **07**

(b) Explain with sketches the traffic volume data representation in transportation studies. **07**

OR

(b) Enlist various types of Origin- Destination (O-D) surveys. How is Road Side Interview (RSI) O-D survey executed? **07**

Q.3 **(a)** Explain theory and objectives of O-D studies. **07**

(b) (i) Write note on ,' Data Analysis for O-D studies'. **07**

(ii)Explain graphical and tabular representation of O-D data.

OR

Q.3 **(a)** (i) Define ***roadway capacity***. Enlist factors affecting roadway capacity. **07**

(ii) Define and explain ***design service volume***.

(b) Construct a Level of Service curve for the following data: **07**

Free flow speed: 110 kmph

Operating speed at $\frac{v}{c}$=1.0 is 55kmph.

Maximum volume recorded = 2000vph

Roadway capacity = 2000 vph.

Mark different level of service on the curve and explain the situation at each level.

Q.4 **(a)** Write detailed note with appropriate sketches : **07**

(i) Off-street parking

(ii) Multilevel parking.

(b) The following data pertains toa short length of an urban parking area. It is proposed to analyze the parking duration and associated parameters: **07**

Sr. No.	Parking duration in minutes	Frequency	Sr. No.	Parking duration in minutes	Frequency
1	10	3	8	80	10
2	20	5	9	90	9
3	30	7	10	100	8
4	40	11	11	110	7
5	50	27	12	120	6
6	60	24	13	>120	3
7	70	11			

(i) Find out average parking duration.

(ii) Number of spaces required when the rate of arrival is 200veh/hr.

OR

Q.4 **(a)** Define the following terms(Any seven): **07**

Delay, Travel time, Running Time, Rate of Motion, Travel Speed, Running Speed, Operating Delay, Stopped Delay, Delay Rates.

(b) The data shown were noted in a travel time study on a 2-mile (3.25km) stretch of a highway using the moving vehicle technique. Determine the travel time and flow in each direction on this section of the highway. **07**

Direction	Travel Time (min)	Number of vehicles		
		Travelling in opposite Direction	Overtaking the Test vehicle	Over taken by Test vehicle
Northbound (NB)				
1	3.20	75	3	1
2	2.80	80	2	2
3	3.25	85	0	1
4	3.01	70	2	1
Southbound (SB)				
1	3.30	78	4	0
2	3.25	74	2	2
3	3.40	79	0	2
4	3.35	82	3	3

Q.5 **(a)** Explain intersection delay studies. Also enlist and explain the factors affecting intersection delays. **07**

(b) What is TSM? Explain TSM objectives, scope and outline. **07**

OR

Q.5 **(a)** Explain overall TSM planning cycle. Write key differences between TSM and long range planning. **07**

(b) Metro city is hosting National Level Function. About 120000 persons are expected to participate in the event. 60% participants are coming in their cars. What types of surveys for traffic management during the event are needed? Write brief conceptual report highlighting issues of traffic. **07**

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