Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016

Subject Code: 2160608 **Date: 27/10/2016**

Subject Name: Urban Transportation system

Time: 10:30 AM to 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)** Define the following: **07**

i. Land use ii. Study area iii. CBD
iv. Screen Line v. Cordon line vi. Zones
vii. Home based and Non home based trips

(b) i. What do you mean by transportation system? Explain the various functions of transportation. **05**

ii. Define urban area as per Census India. **02**

Q.2 **(a)** Explain the various levels of urban transport planning. Also show the basic road patterns in the urban area with the help of sketches. **07**

(b) i. Explain the aggregate and disaggregate approaches to travel demand with their advantages and disadvantages. **04**

ii. Discuss the concept of travel demand. Enlist the factors affecting travel demand. **03**

OR

(b) Write short notes on: **07**

i. Metro Rail Transit System
ii. Bus Rapid Transit System

Q.3 **(a)** Explain the various methods of origin and destination surveys with their advantages and disadvantages. **07**

(b) Enlist the various methods for trip generation. Explain the growth factor methods with their advantages and disadvantages. **07**

OR

Q.3 **(a)** What do you understand by sampling? Discuss the various types of sampling. Also discuss about the various survey data checks. **07**

(b) Explain the gravity model with its calibration. Give the comments on gravity model. **07**

Q.4 **(a)** The following shows the data for vehicle trips per day, as related to income and persons in a household, for one zone of the study area. Develop the trip generation equations, and also show which of the three models is more reliable and why? **14**

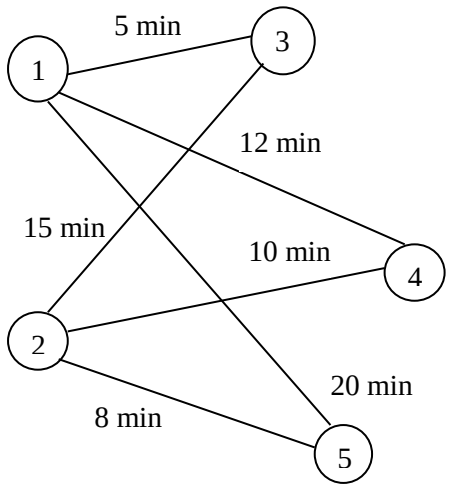
Income (In thousands)	50	100	150	200	250	300
Persons in Household	3	5	6	7	8	10
Trips per day	2	4	4	5	5	7

OR

Q.4 **(a)** The present flows of trips between the four zones A, B, C and D of the study area shown in the trip matrix are given below. The future trip attraction and generation values for each zone are also included, as found in the trip generation analysis. Distribute the trips using the Furness method of trip distribution. (Up-to two iteration) **07**

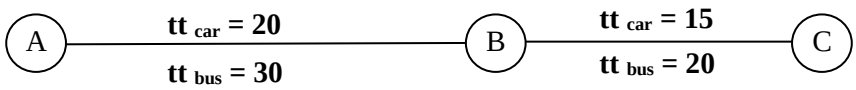
Destination / Origin	A	B	C	D	Future Out-going	Total Present
A	--	100	20	80	340	200
B	20	--	30	20	98	70
C	20	70	--	80	282	170
D	10	10	20	--	52	40
Future Incoming	70	288	90	324	772	
Total Present	50	180	70	180		

(b) Table below shows the number of trips produced and attracted in different zones of an urban area. Using Gravity Model, find the number of trips between zone 1-2, zone 1-4, zone 1-5, zone 2-3, zone 2-4, and zone 2-5, using travel time as shown in the given figure. Assume $K_j = 1$. **07**



Zone No.	Number of Trips	
	Produced	Attracted
1	500	0
2	1000	0
3	0	300
4	0	400
5	0	800

Q.5 (a) Three zones A, B and C are connected by two lane roads as shown in figure below, with travel time by bus shown in bracket and travel time by car. **07**



The probability (P_e) of choosing the car mode is found to be given by
$\mathbf{P_e = 1 / (1+e^{-u(x)})}$ where $\mathbf{U(x) = 0.86 - 0.08(tt_{car} - tt_{bus})}$.
The total trip exchange between zones are as follows:

From	A	B	A	C	B	C
To	B	A	C	A	C	B
Person-trips per day	1200	0	500	1800	400	500

Determine the two way volume in cars per day on the road AB if the average car occupancy is 2.8.

(b) Write short note on: **07**

i. Trip End Model
ii. The TRC Trip Assignment Model

OR

Q.5 (a) Describe corridor identification and screen line analysis. **07**

(b) Explain transportation system management (TSM) strategies. **07**

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