Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER I (NEW) – • EXAMINATION – SUMMER 2017

Subject Code: 2711301 **Date: 10/05/2017**

Subject Name: Urban Transportation Systems Planning

Time: 2:30 pm to 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)** Compare Metro Rail Transit with Bus Rapid Transit System. **07**

(b) What are the objectives of transportation planning? Discuss with flow chart various steps involved in 4 stage- transportation planning process. **07**

Q.2 **(a)** Discuss the significance of Co-ordination in transportation. Also discuss the factors affecting co-ordination. **07**

(b) Write short note on Urban goods movement. **07**

OR

(b) Explain the purpose and uses of O-D survey data. How O-D data are presented? Explain Home-interview method in detail. **07**

Q.3 **(a)** What is trip generation analysis? What are the factors affecting trip generation in an urban area? Explain briefly. **07**

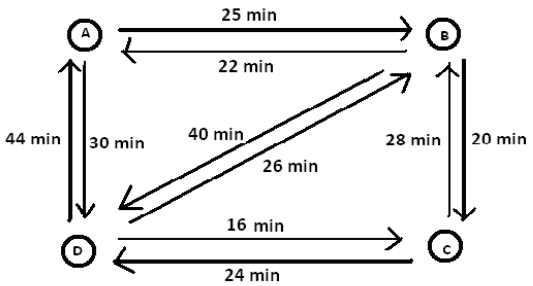
(b) Develop the trip generation equation using linear regression for the following data. Determine the coefficient of determination and discuss about the relationship between the dependent and independent variable. **07**

No. of Workers in House Hold	1	2	3	4	2	5	6	3
Trips per day	3	5	6	7	4	10	12	7

OR

Q.3 **(a)** A four zone city has two residential zones, A and B generating 825 and 375 trips respectively. These trips go to two employment zones C and D attracting 775 and 425 trips, respectively. The travel time in minutes, between zones is AC = 8, BC = 10, BD = 13 and AD = 15. Friction factors corresponding to these travel times are 90, 60, 50 and 10 respectively. The socioeconomic factor kij = 1. What is the distribution of trips? **07**

(b) From the following network, show the minimum path based upon travel time indicated on the links and assign trips to minimum tree and find total volume on each link: **07**



TRAVEL TIME DATA

	To node			
From Node	A	B	C	D
A	-	50	75	35
B	28	-	105	48
C	65	187	-	95
D	125	35	205	-

Trip volumes

Q.4 (a) A Market segment consists of 1500 individuals. A multinomial logit mode choice model is calibrated for this market segment, resulting in following utility function u = BM - 0.30C -0.02T **07**

Where C=out of pocket cost, T= Travel time in minutes,

Transit type	**BM**	**T in minutes**	**C in Rs**
Bus	0.00	30	1.0
Rail	0.40	20	1.50
Auto	2.0	15	2.50

Predict the number of trips by each mode from the market segment.

(b) There are two routes, whose characteristics are given in the following table. The total trips between two zones are 1250 vehicles per hour. Assign the traffic volumes on the routes. **07**

Route number	**Number of lanes**	**Speed limit (mph)**	**Length (miles)**	**Critical volume Vph/lane**	**Critical travel time (min/mile)**	**Ideal travel with no volume (min/mile)**
A	One	40	4	800	4	2.5
B	One	50	5	1000	3	3.5

OR

Q.4 (a) What is the importance of route assignment in travel demand modeling? What is 'All-or nothing' assignment? Discuss its limitations. **07**

(b) What are the limitations of Growth factor methods of Trip distribution? Briefly explain opportunity model. **07**

Q.5 (a) State the significance of land use planning in transportation planning process. Discuss with a neat flow diagram 'Lowry's Land use Model'. **07**

(b) Write short note on Transportation impact study. **07**

OR

Q.5 (a) What is the demand responsive transit system? State its advantages and disadvantages. **07**

(b) Explain Garin-Lowry's Land-use model with its merits over Lowry's model. **07**

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