GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3164017　　　　　　　　　　　　　　**Date:05-12-2024**
Subject Name: Urban Transport System Planning
Time:02:30 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What are the problems in urban transportation in the present scenario of high vehicle ownership?	**03**
	(b)	Explain with flow chart four stages of Travel Demand Modeling.	**04**
	(c)	From the Home interview survey, data given in following table, develop trip generation equation and find R^2 value.	**07**

Vehicle Ownership	2	1	3	2	1	3	4	3	2	4
Trips/day	6	4	8	4	3	10	12	12	5	10

			MARKS
Q.2	**(a)**	Compare in detail LRT with Metro railway system.	**03**
	(b)	Discuss with examples, the importance of Para transit modes.	**04**
	(c)	A study area has been divided in four zones 1, 2, 3, 4. the present trip distribution matrix "M" is given with future total trip productions and trip attractions. Develop the future trip distribution matrix using: Average growth factor method. Do iteration process up to 2 stages.	**07**

O-D Matrix "M":

	1	2	3	4	Total present production	Total future production
1	130	150	160	140	580	920
2	140	100	170	120	530	850
3	120	160	150	140	570	900
4	150	170	130	110	560	880
Total present attraction	540	580	610	510	2240	-
Total future attraction	850	910	970	820	-	3550

OR

			MARKS
	(c)	Develop the future trip distribution from the O-D Matrix "M" given in Q. 2(c), using Detroit method. Do iteration process up to 2 stages.	**07**
Q.3	**(a)**	Show the following in a sketch of study area and zones. (i) Cordon line, (ii) Centroid of zone, (iii) Intra-zonal and Inter-zonal trips.	**03**
	(b)	Discuss with examples, the intra-carrier coordination in transportation.	**04**

(c) Using gravity model find the no. of trips between zones, as per following data. Do iterations up to 2 stages. Assume initially Kij = 1 & α = 2.0. Calibrate the value of α. **07**

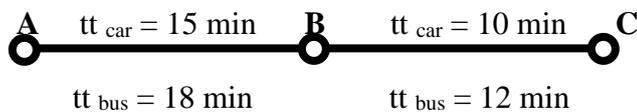| Trips between zones	No. of trips	Travel time in Minute
1 to 3	450	7
1 to 4	350	10
2 to 3	250	10
2 to 4	550	7

OR

Q.3 **(a)** Define: Land use planning, Basic employment, Service employment. **03**

(b) Discuss with sketch about "Diversion curves" for modal split analysis. **04**

(c) Find the trip interchange for the given data using Intervening Opportunity Model. Take l (zone factor) = 0.0005 for all zones. **07**

Zone	1	2	3
Trip Produced	1000	1500	1800
Trip attracted	2000	1800	2200

The order of closeness

O \ D	1	2	3
1	1	3	2
2	3	1	2
3	2	3	1

Q.4 **(a)** What are the factors affecting to mode choice of an individual? **03**

(b) Differentiate between MNL and NL models for mode choice analysis. **04**

(c) Three zones A, B and C are connected by two lane roads as shown in figure below. The probability of choosing the car mode (P_c) is found to be given by **07**
$P_c = 1 / (1+e^{-u(x)})$. Where, $u(x) = 0.70-0.04(tt_{car} - tt_{bus})$

A tt $_{car}$ = 15 min B tt $_{car}$ = 10 min C

tt $_{bus}$ = 18 min   tt $_{bus}$ = 12 min

The total trip exchanges between zones are as follows. Determine the two-way volume in cars per day on the roads AB and BC, if the average car occupancy is 2.3.

From	To	Person trips per day
A	B	1200
B	A	800
A	C	900
C	A	1600
B	C	1000
C	B	700

OR

Q.4 **(a)** What are the major aims and applications of 'Traffic Assignment'? **03**

(b) Briefly describe "All-Or-Nothing" and "TRC" trip assignment models. **04**

(c) The total trip volumes from zone 1 to 2 are 4500. Find the volumes on each route connecting two zones, using the particulars given in table below. Use TRC trip assignment. **07**

Route No.	Length (Km)	Speed (kmph)
1	2.4	30
2	1.5	20
3	1.2	10
4	3.2	32

Q.5 **(a)** What is scheduling problem in transit? **03**

(b) Discuss about Routing Problem in transit operations. **04**

(c) Describe 'Transportation System Management (TSM)' planning, its objectives and various actions. **07**

OR

Q.5 **(a)** Define: Corridor, Screen line, Load factor. **03**

(b) Discuss the measures to increase the capacity of existing urban mass transit system. **04**

(c) Describe with sketch "Urban Goods Movement", its impact on urban traffic and remedial measures. **07**

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