

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-I Remedial Examination April 2010****Subject code: 711301****Subject Name: Urban Transportation Systems Planning****Date: 06 / 04 / 2010****Time: 12.00 noon – 02.30 pm****Total Marks: 60****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** What are the objectives of transportation planning? Discuss with flow chart various steps involved in transportation planning process. **06**
- (b)** Briefly describe different types of urban mass transportation systems with their capacities, advantages and limitations. **06**

- Q.2 (a)** What are the various stages involved in travel demand modeling process? Discuss the significance of each stage. **06**
- (b)** What is the importance of co-ordination in transportation? Discuss its factors and types. **06**

OR

- (b)** State the significance of land use planning in transportation planning process. Discuss with a neat flow diagram 'Lowry's Land Use Model'. **06**
- Q.3 (a)** Explain the following terms with the help of a sketch of study area and zones: **06**
(i) Cordon line, (ii) Zonal centroid, (iii) Intra-zonal trip, (iv) screen line, (v) Desire line, (vi) CBD.
- (b)** What are the factors affecting trip production? Develop trip generation equation for the following data and find coefficient of correlation by linear regression analysis. **06**

No. of workers in house hold	3	4	4	3	2	2	4	5	3	2
Trips/day	8	10	12	8	6	6	10	12	6	4

OR

- Q.3 (a)** Discuss the merits and limitations of (i) Growth factor models, and (ii) Gravity model for the trip distribution analysis. **06**
- (b)** Using a Gravity model with an impedance term of the form $C^{-\alpha}$, estimate the number of trips from zone 1 to all other zones. Take $\alpha = 1.90$. **06**

Zone	Travel time to zone-1 (min)	Productions (trips)	Attractions (trips)
1	-	20,000	10,000
2	10	15,000	30,000
3	20	30,000	18,000
4	15	25,000	10,000
5	30	18,000	40,000

- Q.4 (a)** Explain Trip-interchange type modal split model with an example of Toronto model. How would you use diversion curves for modal split analysis? **06**
- (b)** A market segment consists of 500 individuals. A multinomial logit mode choice model is calibrated for this market segment, resulting in the following utility function: $u = \beta_m - 0.30C - 0.02T$. Where, C = out of pocket cost (Rs.), T = travel time (min). Values of β_m , cost and travel time for a particular O-D pair for three modes are as follows: **06**

Mode	β_m	Cost (Rs.)	Travel time (min)
Bus	0.0	1.00	30
Rail	0.4	1.50	20
Auto	2.0	2.50	15

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

OR

- Q.4 (a)** What are the factors affecting user's route choice behaviour? Explain capacity restraint method for route assignment. **06**
- (b)** The total trip volumes from zone 1 to 2 are 2400. Find the volumes on each route, connecting the two zones using the particulars given in table below by TRC trip assignment. **06**

Route No.	Length (km)	Speed (kmph)
1	2.4	36
2	1.5	24
3	1.2	6
4	2.8	20

Q.5 Write short notes on **Any Two**:

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- (a)** Intermediate Public Transport Services in India.
- (b)** Category analysis for trip generation analysis.
- (c)** Urban goods movement.
- (d)** Transportation impact studies.
