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Name.....

Reg. No.....

**EIGHTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE  
[SUPPLEMENTARY/IMPROVEMENT] EXAMINATION, NOVEMBER 2015**

CE/PTCE 09 803 L16—URBAN TRANSPORTATION PLANNING

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.  
Each question carries 2 marks.*

1. (a) Define travel demand.
- (b) Explain generalised cost.
- (c) Write a note on utility and disutility functions.
- (d) Define trip. How trips are classified ?
- (e) What are the various modal split models used in transportation planning ?

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

2. (a) What are the components of an urban transportation system ?
- (b) How expansion factor is calculated in home interview survey ?
- (c) What are the criticisms of growth factor methods of trip distribution ? Explain the opportunity model.
- (d) What is meant by zoning ? How zoning is carried out for transportation travel demand estimation ?
- (e) What are the factors affecting mode choice ?
- (f) Explain any *one* method of coding the network.

(4 × 5 = 20 marks)

**Part C**

*Answer all questions.*

3. (a) Discuss the inter-relationship between various stages of transportation planning.  
*Or*
- (b) What are the components of an urban transportation system ? With neat sketch explain the hierarchical levels of transportation planning.
4. (a) Explain need for evaluating the survey accuracy ? How these checks are carried out for dwelling sample and travel pattern data ?

*Or*

**Turn over**

- (b) What are the factors affecting trip generation and attraction? Explain category analysis stating the assumptions.
5. (a) Explain the calibration of the gravity model.

The total trips produced in and attracted to the three zones 1, 2 and 3 in the design year are given below. The trips between zones are inversely proportional to square of travel time between zones, which is uniformly 20 minutes. If the trip interchange between zones 1 and 3 is known to be 900, calculate the trip interchanges between all zones.

Zone	Trips produced	Trip Attracted
1	2500	3500
2	3000	2500
3	3500	300

Or

- (b) The number of trips produced in and attracted to the three zones 1, 2, 3 are tabulated as under :

Zone	1	2	3	Total
Trip produced	14	33	28	75
Trip attracted	33	28	14	75

The order of closeness of the zone is as follows :

O/D	1	2	3
1	1	2	3
2	2	1	3
3	2	3	1

The zonal L-Factors for zones 1, 2 and 3 are .04, .02 and .04 respectively. Distribute the trips between the zones.

6. (a) Given the utility function  $U_k = A_k - 0.05 T_k - 0.04 T_a - 0.02 T_r - 0.01 C$

Mode	$A_k$	$T_w$ (Waiting time)	$T_a$ (Access time)	$T_r$ (riding time)	C (out of pocket cost)
Car	0.005	0	5	30	100
Transit	- 0.05	10	10	50	50
Express	- 0.05	12	10	39	75

Estimate the patronage shift that would result from 10% increase in cost and 3% reduction in riding time of transit.

Or

- (b) Explain the minimum path algorithm for determining the shortest path between various nodes in the network. Discuss the effect of route choice in assigning users in the network. How the route choice is accounted in the trip assignment ?

(4 × 10 = 40 marks)