URBAN TRANSPORTATION PLANNING

(18CV745)

QUESTION BANK

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MODULE 1

1. What are the impacts of transportation on environment?
2. Explain the effects of air pollutants from vehicle exhaust gas.
3. Explain the difficulties in urban transportation condition.
4. Write a note on
   (i) Para Transit Transport (ii) Public Transport System (iii) Private Transport
5. Explain System Approach to transportation planning with a flow diagram.
6. Explain the interdependence of land use and transportation.
7. Explain the 4-Stage transport planning model?

MODULE 2

1. Describe how the study area is divided into Zones and mention the factors to be considered while dividing area into zones.
2. List the various methods available for data collection. Explain a) Home Interview Survey b) Registration Number Survey
3. It is required to find origin and destination detail for the given study area. Choose the appropriate methods and explain any three methods.
4. Discuss the various inventory required to collect information related to travel facilities

MODULE 3

1. Explain the various factors governing the trip generation.
2. State the important criteria for the evaluation of regression equation with relative assumption made in analysis of trip generation and discuss the limitations of multiple linear regression analysis and the suitability.
3. Enlist the different methods of trip distribution and discuss the method which considers the average value of trip as the future distribution
4. Discuss the methods to distribute the interzonal trips based on growth factor.
5. The distribution of present trips among zone 1,2 and 3 are given in O-D matrix below. The future trips generated in zone 1,2 and 3 are expected to be 360, 1260 and 3120 respectively. Distribute the future trips among various zone using i) Uniform factor Method ii) Average growth factor method and draw the conclusion based on result.

O/D	1	2	3
1	60	100	200
2	100	20	300
3	200	300	20

6. Determine the future trip distribution by Furness method from the following data (upto two iteration)

O/D	1	2	3	4	Future Trips
1	-	50	60	30	280
2	40	-	70	20	390
3	20	60	-	40	300
4	50	70	30	-	220
Future Trips	200	500	340	150	

7. The following table gives trip distribution between four zones 1, 2,3 and 4. Estimate the future interzonal trip between the four zones. (upto two iteration)

	1	2	3	4	Future Trips
1	10	20	15	18	140
2	21	16	17	14	150
3	30	21	25	27	200
4	10	9	16	13	100
Future Trips	150	120	180	160	

MODULE 4

1. The total trips produced in and attracted to the three zones A, B, and C of a survey area in the design year are tabulated below

Zone	Trip Produced	Trip Attracted
A	2000	3500
B	3500	4800
C	4800	2000

   It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is equally 25 min. If the trip interchange between zones B and C is 300. Calculate the trip interchange between zones A-B, A-C, B-A and C-B
2. Explain Opportunity model of trip distribution.
3. A self-contained town consists of four residential areas A, B, C and D and two industrial areas X & Y. The trips from home-work generated by each residential area are as follows

A	B	C	D
1000	2250	1750	3200

   There are 3700 jobs in industrial estate X and 4500 in industrial estate Y. It is known that attraction between zones in inversely proportional to the square of the journey times between zones. Calculate and tabulate the inter zonal trips for journey from home to work. The journey time in minutes from home to work are as follow:

Zone	X	Y
A	15	20
B	15	10
C	10	10
D	15	20

4. Explain the factors affecting Modal Split
5. With the flow diagram explain Pre-distribution modal split
6. With the flow diagram explain Post-distribution modal split.

7. The calibrated utility function for travel in a medium city by automobile, bus and metro is given by $U = a - 0.002X_1 - 0.005X_2$; X_1 = Cost of travel(Rs) , X_2 = Travel time (min)

   Calculate modal split for given values

Mode	a	X_1	X_2
Automobile	-0.3	120	30
Bus	-0.35	20	45
Metro	-0.40	60	35

   Is a parking fee of 10/- per trip is imposed on automobile, what would be the split to the other two modes?

MODULE 5

1. State traffic assignment and its applications? Explain its general principle.
2. Explain the following
   All -or-nothing assignment b) Methods of capacity Restraint
3. Discuss the important considerations for selecting land-use model
4. Explain the concept of Lowry derivative model with a flow diagram.
5. To overcome congestion on the urban street network, a motorway is proposed. The travel time from one zone centroid to another via the proposed motorway is estimated to be 10min where as the time for same travel via existing street is 18 min. the flow between the two zone centroid is 1000veh/hour. Assign the flow between the new motorway and existing street.
6. Explain the following
   a) Capacity Restraint Method b) Diversion Curves

1	Which of the following model is not used for Modal Split analysis? a) Competing opportunity model b) Probit model c) Logit model d) None of the above
2	Utilities of two transport modes are 1.0 each. Estimate the probability of one of the modes a) 0.45 b) 0.55 c) 0.5 d) 0.6
3	The modal split share CAR:BUS:METRO for a city is 35:20:45. The number of trips made by CAR, BUS & METRO out of total 2500 trips made from origin to destination are _____ , _____ & _____ respectively. a) 500, 875, 1125 b) 875, 500, 1125 c) 1125, 875, 500 d) 500, 1125, 875
4	The estimation of what proportion of total forecasted trips between two zones, shall use the available alternative routes is known as _____ a) Trip generation b) Modal split c) Route assignment d) Trip distribution
5	The basic factor, that lead people to choose one route over the another is _____ a) Travel time b) Travel cost c) Level of service d) All of the above
6	Route assignment is related to _____ a) Assigning existing trips to existing transport network b) Assigning future trips to existing transport network c) Assigning future trips to future transport network d) All of the above
7	Which of the following is not used for route assignment technique? a) Intervening opportunity model b) All or nothing method c) Diversion curve technique d) Multiple route assignment technique
8	_____ is the simplest method for route assignment analysis. a) Diversion curve method b) All or nothing assignment c) Capacity restraint assignment technique d) Multiple route assignment algorithms
9	Which of the following method uses distance ratio as independent variable? a) All or nothing method b) Multiple route assignment method c) Capacity restraint method d) Diversion curve method
10	_____ method is used to estimate the proportion of person or vehicles likely to reroute to a new or improved facility. a) Capacity restraint b) Fratar c) Detroit d) Diversion curve
11	Travel time (Tt) by car and bus is 46 and 72 minutes respectively. The utility function is U = -0.004 (Tt). The probability of car and bus for being chosen by the rider is _____ & _____ a) 47% & 53% b) 53% & 47% c) 50% & 50% d) 60% & 40%
12	Land-use and Transportation are _____ a) Dependent on mobility b) Interdependent on each other

	c) Not dependent on each other d) None of the above
13	In Lowry's Land-use-Transport model _____ is considered as endogenous element. a) Retail sector b) Residential sector c) Basic sector d) Employment
14	In Lowry's Land-use-Transport model the basic employment is _____ allocated to the city planning process a) Endogenously b) Exogenously c) Both A & B d) None of the above
15	A unique property of land-use is its ability or potential to _____traffic a) Divert b) Merge c) Generate d) None of the above
16	Minimum path tree defines a) Route of travel which has least travel time b) Route of travel with less traffic volume c) both a &b d) none of the above
17	In capacity restraint assignment V/C ratio is maintained by a) Reducing number of vehicles assigned b) altering the link travel time c) choosing alternate route d) none of the above
18	The principle component Lawry model includes. a) Population & employment b) Communication between population & employment c) both a & b d) none of the above
19	Diversion curves are derived based on a) travel time saved b) distance ratio c) travel cost ratio d) all of the above
20	A section of a highway network between two intersection a) Node b) Tree c) Link d) Path
21	the procedure to build minimum path in a network a) Columbs Algorithm b) Fratar Algorithm c) Darcy's Algorithm d) Moor's Algorithm
22	The time taken to reach the nodes 21 and 17 from node 1 is given below, which is chosen in critical path a) $T_{1-20} = 3$ b) $T_{1-17} = 3$ c) $T_{1-20} = 4$ d) $T_{1-14} = 4$
23	The method in which driver associates with each link a supposed time to obtain minimum path is ___ a) All or nothing method b) Multiple route assignment method c) Capacity restraint method d) Diversion curve method

24	The basic employment refers to a) employment industries whose output and services are sold in market external to the region under study b) employment industries whose output and services are sold in market internal to the region under study c) Both A and B d) None of the above
25	Distribution and retail is an example for a) Service employment b) Basic employment c)Community employment d) None of these
26	Node defines a) Study area b) Boundary of study area c) Centroid of Study area d) Centroid of network
27	Which of the following method is inappropriate to studies involving planning of improvements to public transport system where significantly different levels of service are contemplated? a) Trip-end modal split b) Trip interchange modal split c) Both A and B d) None of the above
28	Travel time ratio is given by a) The ratio of the travel time by private car and travel time by public travel b) The ratio of the travel time by public transport and travel time by private car
29	In vehicle travel time is a) time spent in public transport vehicle b) time spent in transfer from one public transport vehicle to another c) Time spent in walking from parked vehicle to destination d) All the above
30	Trip end model do not account for_____ a) Trip generation characteristics b) Improvement in future transit service c) Both A and B d) None of the above