GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-II   Examination July 2010

Subject code: 721902

Subject Name: Transportation Planning

Date: 06 /07 /2010   **Time: 11.00am – 1.30pm**
                                                            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)** Explain land-use transportation cycle with flow chart.   **06**

(b) What is Four Stage Method of Transportation planning? Explain with examples.   **06**

Q.2 **(a)** What is trip? Explain significant factors in trip generation. Explain trip generation models.   **06**

(b) Explain different structures (single hub, multi-hub and point-to-point) of air transport service supply.   **06**

OR

(b) Explain three levels of planning: strategic, tactical and project.   **06**

Q.3 **(a)** Explain intervening opportunity model for trip interchanges.   **06**

(b) The number of trips produced in and attracted to three zones 1,2 and 3 are tabulated below: **06**

Zones	1	2	3	Total
Oi	14	33	28	75
Dj	33	28	14	75
Zonal L factors	0.04	0.02	0.04	-

The order of closeness of the zones is given as

i\j	1	2	3
1	1	2	3
2	2	1	3
3	3	1	2

Distribute the trips between the zones using intervening opportunity model.

OR

Q.3 **(a)** Explain, Growth Factor Models of Trip Distribution with appropriate formulae.   **06**

(b) Compute trip distribution from the observed trip matrix and future trips given below. Use average growth factor model.   **06**

i\j	1	2	3	4
1	-	25	50	25
2	25	-	150	75
3	50	150	-	200
4	25	75	200	-

The future trips forecasted zone wise are given as:

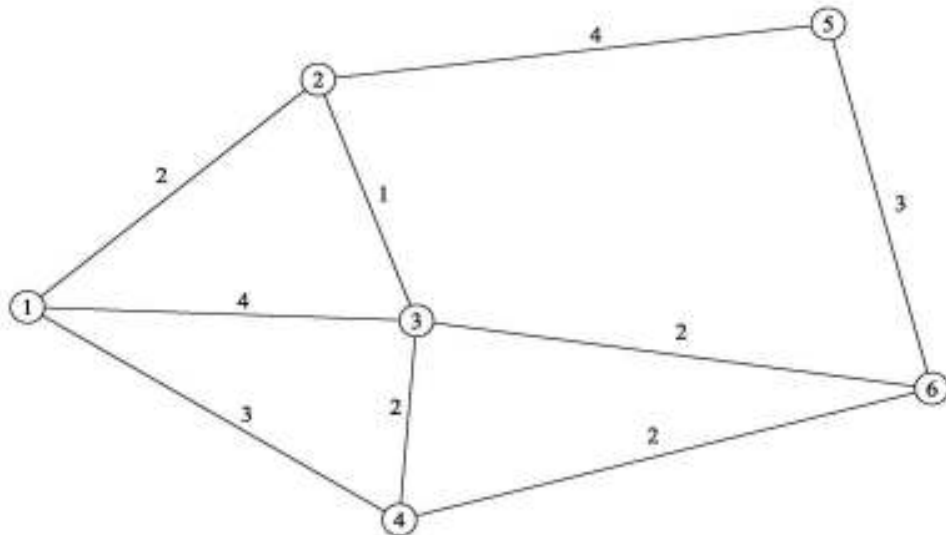| Zone	1	2	3	4
Forecasted trips	300	1000	800	300

Q.4 **(a)** Write note on following method of traffic assignment (any three)   **06**
     I.   Diversion curves
     II.   The Bureau of Public Roads(BPR) Method
     III.   California Curves
     IV.   Detroit Method

    (b) Explain All-or-Nothing Techniques for traffic assignment. Find shortest path   **06**
in the network below. Values on links are travel times in minutes.

OR

Q.4 **(a)** Explain the basic difference between long term (Strategic) planning versus   **06**
short or medium term Transportation System Management(TSM).
    (b) Explain, with flow chart, bottom-up approach for comprehensive Airport   **06**
System Plan (NPIAS).

Q.5 **(a)** Explain two-stage Mode-Split model with flow chart.   **06**
    (b) Consider the following Mode choice and Utility Models and based on   **06**
calibration constants given in table below, compute the probability of mode
choice for transit and automobile.

Mode choice model $P(m,M) = \dfrac{e^{Um}}{\sum\limits_{m' \in M} e^{Um'}}$

Utility model $Um = \theta_m + \theta_1 t_m + \theta_2 \dfrac{x_m}{d} + \theta_3 \dfrac{C_m}{y}$

Calibration Constants: $\theta A = -0.13$, $\theta 1 = -0.03$, $\theta 2 = -0.34$, $\theta 3 = -50$.
d= Distance one way= 7.25, y = Annual income = 5000 units.

Attributes	Automobile (A)	Transit (T)
tm = in vehicle time (one way)	11.3	14.0
Xm =out of vehicle time (one way)	5.0	8.0
C m = out of pocket cost (one way)	122.5	50.0

OR

Q.5 **(a)** Derive equation for generated traffic using Gravity Model.   **06**
    (b) Explain Wilson Entropy Maximization Model for Trip Distribution.   **06**

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