

M. E. (C.E.) 2nd Semester Final Examination, 2013

Transportation Planning & Management (CE 1024)

Full Marks 70

Time 3 hours

Assume data if necessary
Answer any FIVE questions

1. a) Describe how projection of traffic for improvement of a National Highway corridor passing through a city can be undertaken. [6]
b) A town with a single CBD has basically three major activities – A, B and C. The gross income from per unit area for activities of A, B, and C are ₹100.00, ₹80.00 and ₹50.00 respectively. The transportation cost per kilometer for these activities are ₹50.00, ₹20.00 and ₹5.00 respectively. Determine likely land use pattern of the town. Explain the method. [8]
2. a) What is the purpose of trip generation in comprehensive transport planning? Discuss what you mean by trip production, trip attraction, home-based trip and non-home based trip. [4]
b) Explain the different trip generation methods with their merits and demerits. [6]
c) Why is in comprehensive transportation planning process the study area divided into a number of analysis zones? Discuss the factors that are playing important roles in dividing the transportation study area into various zones. [4]
3. a) Describe how gravity model can be calibrated [4]
b) A particular amusement park attracts 1000 trips in peak hour. These trips may be generated from four residential areas. A logit model is developed to estimate the number of trips distributed from residential area to amusement park. Three parameters -- population in thousands, distance between residential area and amusement park in kilometer and average car ownership – are found to influence the destination selection. The logit model coefficients of these three parameters are 0.2, (-) 0.15 and 0.9 respectively. The possible characteristics of these parameters for the four residential areas (R1, R2, R3 & R4) are given below. Determine number trips to be attracted to the amusement park from each residential area. [10]

Residential Area	Population (thousands)	Distance (kilometer)	Average Car Ownership
R1	15.5	12	0.5
R2	6.0	8	1.0
R3	0.8	3	0.8
R4	5.0	11	1.5

4. a) Distinguish between all or nothing method and capacity restraint method. [4]
b) Two routes, A & B, connecting two points P & Q with performance functions $T_A = 5 + 3X_A$ and $T_B = 7 + X_B$ where 'T' indicates time in minutes and 'X' indicates traffic volume in terms of thousands of vehicles per hour. If future trip distribution indicates that total demand between P

and Q will be 7000 vehicles per hour, determine user equilibrium and system optimal flow and time in each route. Also discuss on user equilibrium and system optimal approaches. [10]

5. a) Why is Fratar Model classified as growth factor model? Explain Fratar model. [6]
- (b) It was observed during the survey of a parking lot at an office complex that 25% of those wishing to park are turned back every day during the open hours of 9 a.m. to 7 p.m. due to lack of parking spaces. An analysis of data indicates that 60% of those who park are office staff, with an average parking duration of 8 hrs & the remaining are visitors, whose average parking duration is 3 hrs. If 20% of those who cannot park are office staff and the rest are visitors and a total of 250 vehicles currently park daily at the garage, determine the number of additional spaces required to meet the excess demand. [Assume parking efficiency= 0.80] [8]
6. a) Discuss various parameters that characterize a transit system operation in a city [8]
- b) Classify transit system according to technological characteristics and right-of-way with examples. [6]
7. Write briefly on [4 x 3½]
- i) Utility function in Modal Choice
 - ii) Parking accumulation & Parking turnover
 - iii) Transit Transfer point and Storage place
 - iv) Characteristics of On-hire Paratransit service
