INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY, SHIBPUR

M. E. (C.E.) 2nd Semester Final Examination, 2014

Transportation Planning and Management (CE-1024)

Time: 3 Hours. Full Marks: 70

Assume data if necessary

Answer any *FIVE* questions

1.

a. State salient features of the recommendations of National Transport Policy Committee, 1980.

b. Discuss the following in view of National Urban Transport Policy, 2006.

i. Equitable allocation of road space with people

ii. Multimodal public transport system

iii. Institutional capacity development.

[5 + 9 = 14]

2.

a. It was observed during the survey of a parking lot that 25% of those wishing to park are turned back every day during 9 A.M. to 7 P.M. due to lack of parking spaces. An analysis of data indicates 65% of those who park are commuters with an average parking duration of 8 hours and remaining are shoppers whose average parking duration is 2 hours. If 20% of those who cannot park are commuters and rest are shoppers and total 250 vehicles currently park daily at the parking lot, determine the number of additional spaces required to meet the excess demand assuming parking efficiency as 0.8.

b. Briefly discuss *any two*

i. Classification of public transportation according to ownership and operator's characteristics

ii. Bus Rapid Transit System

iii. Steps involved in Route Planning & scheduling process of bus transportation in a city.

[6 + 8 = 14]

3.

a. Define Study area? Define 'External Cordon Line'. What are the factors considered for fixing the external cordon line?

b. What are the important points kept in view while dividing the area into zones? Mention the different types of transport surveys that are to be carried out.

[3 + 4 + 3 + 4 = 14]

4. An analyst came up with the following regression equations and a simple correlation matrix for 20 zones, as given:

$Y=50.5+0.80X_1$ (SEE = 210, $R^2 = 0.95$, t = 34)..... (i)

$Y=308+0.79X_2$ (SEE = 844, $R^2 = 0.88$, t = 29)..... (ii)

$Y=52.7+0.85X_2+1.75X_3$(SEE = 205, $R^2 = 0.98$, t = 60; 22)..... (iii)

$Y=-105+1.38X_2-0.4X_3+0.1X_4$(SEE = 155, $R^2 = 0.97$, t = 3;2;0.5)..... (iv)

Where,

Y= trips produced; X_1=total population; X_2= population with low and medium income; X_3= population with high income; X_4= total number of school-going children

	Y	X_1	X_2	X_3	X_4
Y	1.00	0.95	0.85	0.42	0.23
X_1		1.00	0.92	0.53	0.22
X_2			1.00	0.35	0.09
X_3				1.00	0.12
X_4					1.00

Comment on the suitability of these equations for use in a transportation study. (Acceptable t value is 3.7)

[14]

[P.T.O]

5. The trip interchanges among three zones are as shown in the table given below. It also shows the predicted total trips to be produced and to be attracted in future (as obtained from trip generation model). Distribute the future trips using **average growth factor method.**

Zones	1	2	3	**Present total trips produced**	**Predicted future total trips produced**
1	200	500	600	1300	3000
2	500	150	400	1050	1400
3	600	400	250	1250	2000
Present total trips attracted	1300	1050	1250		
Predicted future total trips attracted	3000	1400	2000		

[14]

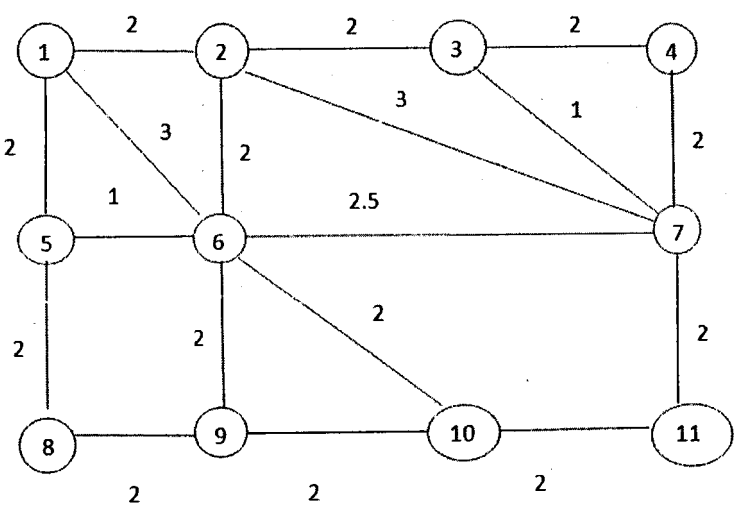
6. Given the utility expression: $U_k = A_k - 0.05T_a - 0.04T_w - 0.02\ T_r - 0.01C$
Where T_a is access time, T_w is waiting time, T_r is the riding time and C is the out-of-pocket cost.
   a. Apply the logit model to calculate the shares of the car mode ($A_k = -0.005$) and a mass-transit mode ($A_k = -0.05$) if

Mode	T_a	T_w	T_r	C
Car	5	0	30	100
Transit	10	10	45	50

   b. Estimate the patronage shift that would result from doubling the bus out-of-pocket cost.

[14]

7. A part of the street network in the CBD of a city is shown in the figure below. Travel times for each link are also shown. 2000 vehicles enter the network through the origin node 1 and go to destination node 11. Using probabilistic assignment technique, find the efficient paths and volumes in each link considering $\theta = 0.6$.



[14]

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