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221TCE009122301

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

First Semester M.Tech Degree Regular and Supplementary Examination December 2023 (2022 Scheme)

Discipline: CIVIL ENGINEERING

Course Code &Name: 221TCE009-URBAN TRANSPORTATION PLANNING

Max. Marks: 60 Duration: 2.5 Hours

PART A

Answer all questions. Each question carries 5 marks Marks

1 Discuss the concepts of trip based and activity based approaches for travel demand estimation. (5)

2 Discuss about the need to collect data in the transportation planning process. What are the various types of data that are required to be collected? (5)

3 List types of synthetic trip distribution models. Explain the phases involved in the calibration of Gravity model (5)

4 Discuss the factors affecting modal choice? Explain the mathematical concepts used to construct stochastic modal choice functions for individual behaviour modal split models? (5)

5 Explain various non-transport solutions for urban transport problems. (5)

PART B

Answer any 5 questions. Each question carries 7 marks

6 With the help of flow chart, explain the traditional four step travel demand forecasting process (7)

7 Discuss the objectives of O-D surveys. Explain home interview method of data collection. How the sample size for the same is fixed. (7)

8 Using Fratar method estimate given trip matrix. Provide one iteration (7)

O \ D	A	B	C	D
A	-	10	12	18
B	10	-	14	14
C	12	14	-	6
D	18	14	6	-
Estimated future totals	80	114	48	38

9 A market segment has 1000 individuals. A multinomial logit mode choice model is calibrated resulting in the following utility function (7)

U=$ak - 0.32C - 0.02T$, where C is out of pocket cost, T is travel time in minutes and ak *is* mode specific constant. The attributes specific to each mode is given below. Predict the number of trips by each mode from the market segment.

Mode	ak	C	T
Bus	0	1.5	35
Rail	0.4	1.75	20
Auto	2.2	2.75	15

10 Discuss the purpose of land use transportation model. Describe the structure of Lowry model. (7)

11 a) Define home based and non-home based trips with example. (2)

b) Discuss the guidelines for zoning. Explain the importance of cordon line and screen line. (5)

12 Explain the user equilibrium concepts in traffic assignment. List various traffic assignment techniques. Explain any one, stating its advantages and limitations (7)

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