APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

Q. P. Code: TE0819205-I

(Pages: 5)

Name: ....

Reg. No:.........................

FIRST SEMESTER M.TECH. DEGREE EXAMINATION DECEMBER 2019

Branch: Civil Engineering

Specialization: Transportation Engineering

08CE6205 URBAN TRANSPORTATION

Time:3 hours

Max. marks: 60

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	Briefly discuss about the assumptions that form the basis for transportation planning.	3

Answer b or c

b	With a neat flowchart explain the sequence of activities in transport analysis.	6
c	Explain the various urban transportation problems.	6

Q.no.	Module 2	Marks
2.a	Write a short note on zoning of a study area.	3

Answer b or c

b	Develop a linear regression model for trip generation and comment on goodness of fit parameters.	6

Zones	1	2	3	4	5	6	7	8	9
Population (in 100s)	18	31	42	61	73	93	106	118	133
Trips produced (in 100s)	63	102	147	201	232	294	324	381	429

c Explain category analysis of trip generation with its advantages and disadvantages.   6

3.a Describe the procedure of calibration of gravity models.   3

Answer b or c

b A town consists of four residential zones 1,2,3 and 4 and two employment producing zones A and B. The trip generation for the design year shows the trip pattern from residence to work as follows: 6

Zone	Trips generated
1	1200
2	2400
3	1700
4	3100

There are 4000 jobs and 4400 jobs in zones A and B. It is known that the trip attraction between two zones is inversely proportional to the travel time between them. Calculate and tabulate the interzonal trips from home to work using Gravity model. The travel times are given as follows:

Zones	A	B
1	25	20
2	24	13
3	11	15
4	17	21

c Develop the future trip distribution matrix using Detroit method. The base year trip matrix and horizon year trip ends are given below: 6

Pi	3000	3000	4000
Aj	2000	4500	3500

2

O/D	1	2	3
1	200	700	500
2	600	100	800
3	400	900	300

Q.no.		Module 4	Marks

4.a Explain how the characteristics of transportation system affect mode split.   **3**

Answer b or c

b A calibrated utility function for travel in a medium sized city by automobiles, bus and light rail is $U = a - 0.002 x_1 - 0.05 x_2$ where x_1 is the cost of travel in cents and x_2 is travel time in minutes. Calculate the modal split for the given values.   **6**

Mode	a	x_1	x_2
Automobile	-0.3	130	25
Bus	-0.35	75	35
Light Rail	-0.4	90	40

If a parking fee of 1 dollar per trip is imposed, what would be the split to other two modes and comment on the results.

c Explain the procedure for Logit Model of Mode Split.   **6**

A calibrated utility function for auto and transit travel are:

Auto: $U(a) = - 0.3 – 0.04x – 0.1 y -0.03c$

Transit: $U(t) = - 0.04x – 0.1 y – 0.03 c$. where x is the vehicle travel time, y is out of vehicle travel time and c is cost of travel per income.

A traffic zone has the following characteristics:

	Auto	Transit
In Vehicle time x	15	40
Out of vehicle time(min) y	5	10
Travel cost(cent) c	300	75

3

What is the probability that a person with an income of 10,000 dollars will travel by transit?

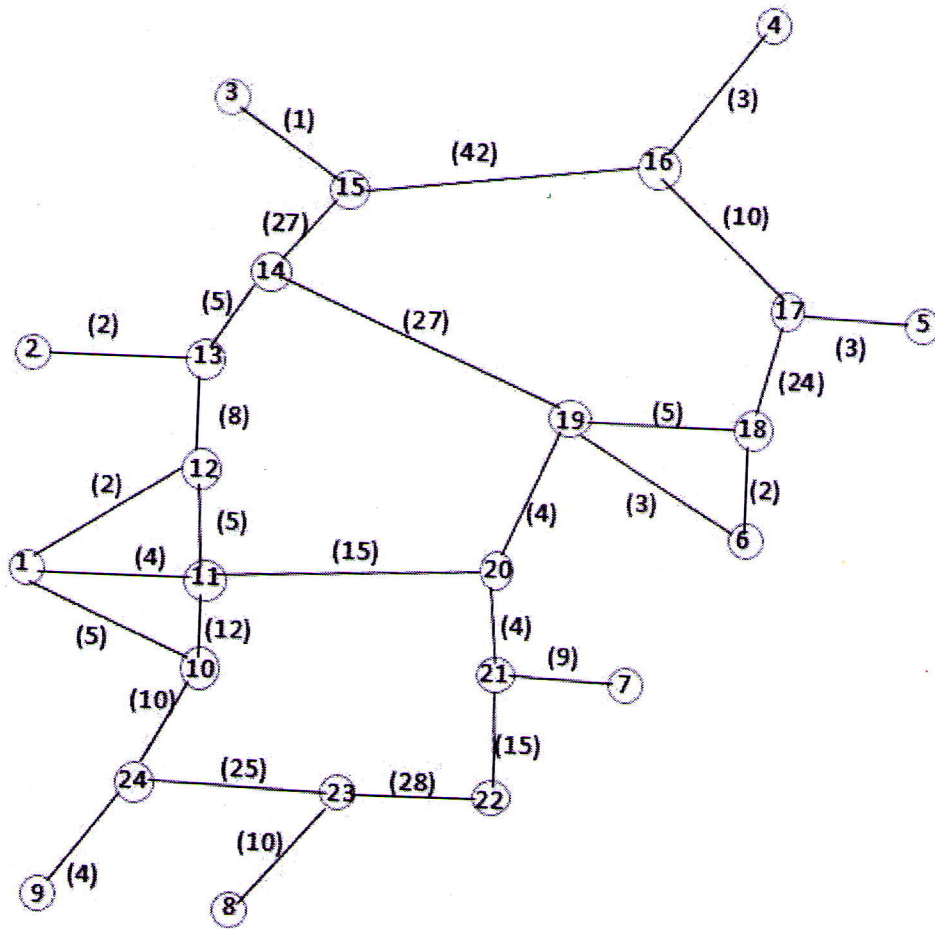| Q.no.	Module 5	Marks

5.a Explain the use of diversion curves in Route Split Analysis.

4

Answer b or c

b Using Dijkstra Algorithm, find out the minimum path from the home node 4 and draw the skim tree.
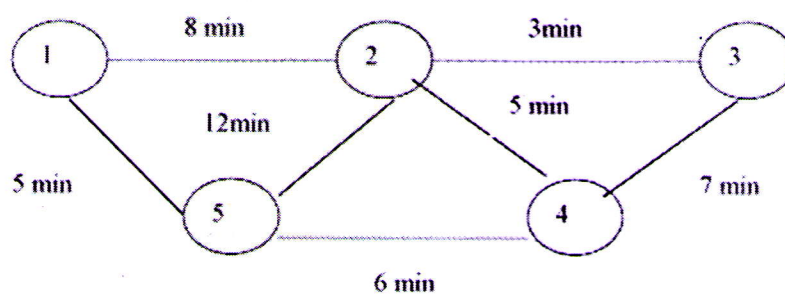
8

c Assign the vehicle trips shown in the following O-D trip table to the network,   **8** using the all-or-nothing assignment technique.

From/to	Trips between Zones				
	1	**2**	**3**	**4**	**5**
1	-	100	100	200	150
2	400	-	200	100	500
3	200	100	-	100	150
4	250	150	300	-	400
5	200	100	50	350	-

6.a Describe any two of the transportation planning software used in industry   **4**

<div align="center">Answer b or c</div>

b What is corridor? How do you determine their performance?   **8**

c Explain the role of GIS in Transportation Planning?   **8**