NAVRACHANA UNIVERSITY
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School: School of Engineering and Technology
Program/s: B.Tech Civil Engineering
Year: 4th   Semester: 7th
Examination: End Semester Examination
Examination year: November - 2023

Course Code: CE413   Course Name: Transportation Planning and Pavement Design - I
Date: 23/11/2023   Total Marks: 40
Time: 10:00am to 12:00pm   Total Pages: 2

Instructions:

→ Write each answer on a new page.
→ Use of a calculator is permitted.

Q. No.	Details	Marks	CO	BTL
Q.1	**Answer following: (Any two)** 1. What is the significance of land use and travel forecast in UTP system? 2. State the main sets of factors affecting Modal choice of rider. 3. Enlist methods of Route assignment and explain Diversion curve in brief.	10	CO1, CO2	BTL1, BTL2, BTL5
Q.2	The distribution of present trips among zones 1, 2 and 3 are given in the O.D matrix below. The future trips produced from zones 1, 2 and 3 are expected to be 1300, 1200 and 1100 respectively and the future trips attracted to zones 1, 2 and 3 are expected to be 1100, 900 and 1200 respectively Distribute the future trips using Detroit method among zones till the generated future trips meet the calculated future trips. Take 1.5 as a growth factor for whole area.	06	CO3	BTL1, BTL2, BTL5, BTL7

O \ D	1	2	3
1	600	100	400
2	100	200	300
3	200	300	200

Q. No.	Details	Marks	CO	BTL
Q.3	In zone A, Car drivers produce work trips amounting 2000. It desired to distribute these trips to zone A, B, C and D with following characteristics. Zone A – has 1000 trios attracted and travel time 11mins. Zone B – Travel time of 20mins and attracted trips 700. Zone C – attracted trips 6000 and travel time 23 mins. Zone D – Attracted trips 3000 and travel time 25 mins.	06	CO2	BTL5, BTL3

Travel time	F (factor)
11	80
16	61
20	49
21	47
23	45
25	39
28	40

| Q.4 | The zones A, B, C and D are connected by one lane road, the travel time by bus and | | | 08 | CO4 | BTL1, BTL5, BTL7 |

The zones A, B, C and D are connected by one lane road, the travel time by bus and car is given in table:

The total trip exchanges between zones are:

A − B = 1000, B − C = 150, C − D = 1500, A − D = 700.

Calculate the probability for car and Bus using binary mode choice model for each way.

Where, $G(x) = 0.86 − 0.08(tt_{car} − tt_{bus})$.

Zones	Travel time by Car	Travel time by bus
A − B	20	15
B − C	15	10
C − D	25	15

| Q.5 | | | | | | | | 10 | CO3, CO4 | BTL5, BTL6 |

Figure below shows a simple network of roads and travel times. Construct minimum path tree, show distribution of trips from origin Node 5 to destination Node 3, on the tree using **Moore method.**

Origin	1	2	3	4	6	7
Node 5	100	200	200	300	100	500

************End of Question Paper************