

Birla Institute of Technology and Science, Pilani  
 First Semester 2023-24  
 Mid-Semester Examination  
**CE G565: Transportation Planning**

**Maximum Duration: 90 minutes**

**Maximum Marks: 50**

1. A trip generally materializes after the trip-maker makes certain decisions. What are the decisions that can aptly capture the entire trip-making behavior of an individual? [05]
2. Why transportation demand is a derived demand? Discuss briefly. [05]
3. Find out the elements of the correlation coefficient matrix from the data provided in Table 1 and comment on the possible regression equation for predicting the number of trips. [20]

Table 1: Demographic and corresponding trip data.

| S. no. | Number of trips ( $Y$ ) | Total population ( $X_1$ ) | Employed population ( $X_2$ ) |
|--------|-------------------------|----------------------------|-------------------------------|
| 1      | 5826                    | 7014                       | 4978                          |
| 2      | 3664                    | 4818                       | 2930                          |
| 3      | 4232                    | 8789                       | 3969                          |
| 4      | 3721                    | 5805                       | 2997                          |
| 5      | 1944                    | 3054                       | 1765                          |
| 6      | 4467                    | 9463                       | 4141                          |
| 7      | 1907                    | 2735                       | 1614                          |
| 8      | 2743                    | 7841                       | 2931                          |
| 9      | 2159                    | 5708                       | 1987                          |
| 10     | 4989                    | 5979                       | 4018                          |

4. By making use of the details provided in Tables 2 and 3, estimate the horizon year trip interchange matrix using Fratar method. (carry out three iterations) [20]

Table 2: Horizon year trip productions and trip attractions of various zones.

|                 | Zone-1 | Zone-2 | Zone-3 |
|-----------------|--------|--------|--------|
| Trip production | 550    | 700    | 850    |
| Trip attraction | 500    | 550    | 750    |

Table 3: Base year trip interchange matrix.

|        | Zone-1 | Zone-2 | Zone-3 |
|--------|--------|--------|--------|
| Zone-1 | 75     | 150    | 250    |
| Zone-2 | 100    | 125    | 200    |
| Zone-3 | 150    | 150    | 175    |