

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII • EXAMINATION – WINTER 2013****Subject Code: 170604****Date: 28/11/2013****Subject Name: Urban Transportation System****Time: 10:30 TO 01:00****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain a flow diagram “Transportation Planning Process” with sketch. 7  
 (b) Define “Urban Areas” and “Rural Areas”. Explain types of urban roads by drawing sketch. 7
- Q-2** (a) Enlist the methods of trip generation analysis. Explain zonal regression analysis in detail 7  
 (b) Develop the trip generation equation from the following data. 7

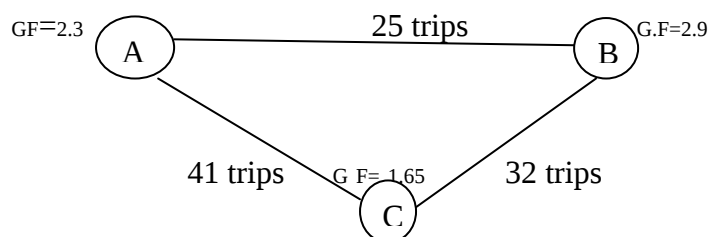
| No. of persons in house hold | Vehicle ownership | Trips per day |
|------------------------------|-------------------|---------------|
| 5                            | 2                 | 4             |
| 4                            | 2                 | 4             |
| 3                            | 2                 | 3             |
| 1                            | 0                 | 2             |
| 2                            | 1                 | 1             |
| 6                            | 3                 | 7             |
| 8                            | 3                 | 9             |
| 9                            | 4                 | 8             |

**OR**

- (b) Explain – Environment-Land use and Transportation (ELT) with sketch of urban system. 7
- Q.3** (a) Explain different levels of urban Transportation Planning stages of with sketch. 7  
 (b) Enlist the different types of road patterns. Draw neat sketch of Rectangular and Circular road pattern. 7

**OR**

- Q-3** (a) Define :- (i) Interzonal trips (ii) Land use (iii) Desire line 7  
 (iv) Base year (v) Horizon year (vi) Study area  
 (vii) CBD
- (b) The three zones A, B and C are shown in the figure with trip interchanges. Using Fratar method, compute the zonal interchanges for the forecast year. 7



- Q.4** (a) What are the limitations of Growth Factor methods for trip distribution analysis? Explain Gravity model with formula. 7
- (b) A self contained city having four residential area A, B, C and D, Two industrial estates X and Y, the generation equation shows that trips from home to work from each residential area are given below during 24 hours per day. There are 3690 jobs in X zone and 4495 jobs in Y zone. It is also known that attraction between zones is inversely proportional to square of journey times between zones. The journey time is mentioned below. 7

| Zones | X  | Y  |
|-------|----|----|
| A     | 14 | 19 |
| B     | 16 | 11 |
| C     | 9  | 11 |
| D     | 14 | 21 |

Calculate the inter zonal trips for home to work by Gravity Model.

A = 1,000; B=2,245; C=1,750; D=3,190

**OR**

- Q. 4** (a) (i) Explain private travel and para transit. 7  
(ii) Explain by giving formula for transit line capacity 7
- (b) Explain the line capacity of rapid transit line. 7

- Q. 5** (a) Explain Trips end model and Trip interchange model with formula. 7
- (b) The design year total persons trip between four zones distributed are shown in table. Modal splits show that 65/35 private cars Vs Public transport as overall split. The peak period occupancies are 2.1 persons per car and 49 persons per bus. If the goods vehicles constitutes about 21% of total vehicle trips. Develop the trip matrix for two modes 7

| D<br>O | A   | B    | C   | D    |
|--------|-----|------|-----|------|
| A      | --  | 1688 | 390 | 1980 |
| B      | 280 | --   | 475 | 505  |
| C      | 410 | 1225 | --  | 1425 |
| D      | 190 | 255  | 435 | --   |

**OR**

- Q-5** (a) What is corridor? Explain by drawing sketch typical corridor components. 7
- (b) Enlist the factors affecting the Route choice. Explain TRC trip assignment model. 7

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