

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Examination January 2010

Subject code:711902**Subject Name: Traffic Engineering & Field Studies****Date: 22 /01 / 2010****Time: 12.00 – 2.30 PM****Total Marks: 60****Instructions:**

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

Q.1 (a) Enlist and explain methods for measuring spot-speeds based on measurements of time over a fixed distance. What are the applications of spot-speed studies? **06**

(b) Give time-based classification of traffic volume and its applications. Explain intersection flow diagram with sketch. **06**

Q.2 (a) What is the application and meaning of “Peak Hour Factors” and “Load factors”? **06**

(b) Describe causes of delay in traffic. Why intersection delay studies are important? Which are the factors affecting intersection delays? **06**

OR

(b) Write note on:(i) On –street Parking **06**
(ii) Multi-level parking

Q.3 (a) Explain procedure of conducting a traffic volume study with appropriate volume data sheet. Enlist man power requirements. **06**

(b) From the given frequency distribution table calculate mean, standard deviation and CV of speeds. **06**

| Class limits kmph | Mid point kmph | Frequency |
|-------------------|----------------|-----------|
| 29.95-34.95 | 32.45 | 1 |
| 34.95-39.95 | 37.45 | 3 |
| 39.95-44.95 | 42.45 | 6 |
| 44.95-49.95 | 47.45 | 9 |
| 49.95-54.95 | 52.45 | 12 |
| 54.95-59.95 | 57.45 | 10 |
| 59.95-64.95 | 62.45 | 5 |
| 64.95-69.95 | 67.45 | 1 |
| 69.95-74.95 | 72.45 | 1 |

OR

- Q.3 (a)** A team of M.Tech.TSE students conducted a field study on 2.25km long stretch of roadway for estimating volume and travel time by Moving Car Method. The average results of observation in six trips are tabulated below. **06**

| Trip Direction | Travel time (Min) T | Vehicle met by test car from opposite direction M | Vehicle overtaking test car O | Vehicles passed by test car P |
|-------------------|-----------------------|---|---------------------------------|---------------------------------|
| North bound trips | 2.61 | 84 | 1.5 | 1.0 |
| South bound trips | 2.42 | 111.5 | 0.5 | 1.0 |

Determine:(i)North and South bound hourly volumes.(ii)Average travel time,(iii)Travel speed, kmph

- (b)** Write note on: Application of PIEV theory in analyzing the behaviours of road-users. **06**
- Q.4 (a)** Explain home interview survey for O-D study with appropriate questionnaire form. How O-D data are represented? **06**
- (b)** Explain vehicular characteristics as road users. **06**

OR

- Q.4 (a)** Define following terms: **06**
Parking accumulation, parking loads, parking duration, parking space-hour.
- (b)** Following data pertains to a short length parking study of an urban area. Find out average parking duration and number of spaces required for the arrival rate of 200 vehicles per hour. **06**

| Sr.No | Parking Duration | Frequency |
|-------|------------------|-----------|
| 1 | 10 | 3 |
| 2 | 20 | 5 |
| 3 | 30 | 7 |
| 4 | 40 | 11 |
| 5 | 50 | 27 |
| 6 | 60 | 24 |
| 7 | 70 | 11 |
| 8 | 80 | 10 |
| 9 | 90 | 9 |
| 10 | 100 | 8 |
| 11 | 110 | 7 |
| 12 | 120 | 6 |
| 13 | > 120 | 3 |

- Q.5 (a)** Define and explain basic capacity and ideal capacity of roadway. Enlist various factors affecting capacity. What is Capacity value for a single lane homogeneous traffic roadway? **06**

- (b)** Construct a LOS curve for the following data. **06**
Free flow speed=110 kmph
Operating speed at $(v/C) = 1$, is 55 kmph.
Maximum volume recorded = 2000vph
Roadway capacity = 2000vph
Show different LOS on the curve.

OR

- Q.5 (a)** Draw sketches of various grade separated intersections with interchanges. **06**
- (b)** Enlist and explain factors affecting rotary intersection design. **06**
