

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VI EXAMINATION – WINTER 2025

Subject Code: 3160615

Date: 25-11-2025

Subject Name: Traffic Engineering and Management

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

|  | MARKS     |
|--|-----------|
| <b>Q.1</b> (a) Discuss the scope of traffic engineering.   | <b>03</b> |
| (b) Write short note on on-street parking and their design standards.  | <b>04</b> |
| (c) Define the following:  | <b>07</b> |
| (1) Time mean speed (2) Traffic Density (3) Time headway   |           |
| (4) Design speed (5) Parking index (6) Parking turn-over   |           |
| (7) Highway Capacity   |           |
| <b>Q.2</b> (a) Explain (i) Isochrones (ii) Passenger Car Unit  | <b>03</b> |
| (b) Enlist the methods of spot speed study and explain enoscope method.  | <b>04</b> |
| (c) Explain permanent physical factors of road user.   | <b>07</b> |
| <b>OR</b>  |           |
| (c) Explain vehicle resistances and power requirements to be encountered by a vehicle in operation.  | <b>07</b> |
| <b>Q.3</b> (a) Enlist methods for travel time and delay study and explain any one.   | <b>03</b> |
| (b) The average length of vehicle in traffic is 7 m and average distance is 3 m between the cars. Average time headway at maximum flow is 3.0 seconds. Calculate (i) Jam density (ii) Maximum flow (iii) Optimum density at maximum flow (iv) Optimum speed at maximum flow. | <b>04</b> |
| (c) Explain Green shield model showing the relationship between traffic flow parameters.   | <b>07</b> |
| <b>OR</b>  |           |
| <b>Q.3</b> (a) Explain: histogram, frequency distribution curve and cumulative frequency curve with the help of sketch.  | <b>03</b> |
| (b) The vehicles pass 1 km length of road in 1 min, 2 min, and 3 min time respectively. Find the time mean speed and space mean speed.   | <b>04</b> |
| (c) Enlist the various methods of traffic volume study.  | <b>07</b> |
| <b>Q.4</b> (a) Write advantages and disadvantages of a rotary intersection.  | <b>03</b> |
| (b) Draw the phase diagram for two phase and three phase system of traffic signal.   | <b>04</b> |
| (c) Explain various methods of origin and destination study.   | <b>07</b> |
| <b>OR</b>  |           |
| <b>Q.4</b> (a) Draw the sketch of the following:   | <b>03</b> |
| (i) Trumpet interchange (ii) Diamond interchange   |           |
| (b) Differentiate between condition diagram and collision diagram.   | <b>04</b> |
| (c) Explain various types of parking surveys.  | <b>07</b> |

- Q.5** (a) Draw the conflict points for (i) cross roads (both two ways) and (ii) cross roads (one two way and other one way) **03**  
(b) Write short note on signal coordination. **04**  
(c) Discuss various elements of rotary design. **07**
- OR**
- Q.5** (a) Write short note on: Level of Service (LOS). **03**  
(b) Write a short note on: Intelligent Transport System (ITS). **04**  
(c) Discuss the preventive measures to decrease the accident rates on roads. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3160615****Date:05-12-2024****Subject Name:Traffic Engineering and Management****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define: Perception time, Intellection time, Volition time **03**  
 (b) Explain vehicular characteristics. **04**  
 (c) Describe various causes and preventive measures for road accidents. **07**

- Q.2** (a) Enlist the function of traffic engineer. **03**  
 (b) Explain collision diagram and condition diagram. **04**  
 (c) Discuss about Origin and Destination survey in detail. **07**

**OR**

- (c) Discuss traffic forecasting based on past trends. **07**

- Q.3** (a) Draw fundamental diagram of traffic flow parameter. **03**  
 (b) Write short note: On-street parking system. **04**  
 (c) Write the cases of bottlenecks and explain any one case with neat sketch. **07**

**OR**

- Q.3** (a) Draw the cumulative frequency curve. **03**  
 (b) Ten spot speed surveys are: 69,63,40,72,75,58,65,34,38,47  
 Calculate: (1) Time mean Speed (2) Space mean Speed **04**  
 (c) Describe the various methods of travel time and delay study. **07**

- Q.4** (a) Draw any three regulatory sign. **03**  
 (b) Differentiate grade separated and at grade intersections. **04**  
 (c) Enlist various methods of designing fixed time signal and explain webster's method. **07**

**OR**

- Q.4** (a) Draw clover leaf interchange with notation. **03**  
 (b) Write short note on: Rotary intersection. **04**  
 (c) Design an isolated fixed time 2 – phase traffic signal for following design hour traffic flow for a right-angled intersection. Design optimum cycle length using Webster's formula and sketch timing diagram and phase diagram. **07**

| Flow/legs        | North | East | South | West |
|------------------|-------|------|-------|------|
| Flow q in PCU/hr | 700   | 500  | 400   | 350  |
| Flow s in PCU/hr | 1600  | 1400 | 1300  | 1350 |

- Q.5** (a) List out the factors affecting highway capacity and level of service. **03**  
 (b) What are objectives of traffic demand management? Also list out commonly adopted techniques for traffic demand management. **04**  
 (c) Describe the various traffic management measures adopted to control traffic. **07**

**OR**

- Q.5** (a) Discuss about various highway terminal facilities. **03**  
 (b) Write short note on: Intelligent Transport System (ITS). **04**  
 (c) Discuss PCU for rural and urban area according to stated in Indo-HCM. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3160615****Date:13-12-2023****Subject Name: Traffic Engineering and Management****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What are the functions of traffic Signal at intersection? Explain. **03**  
(b) What are the methods of controlling on street parking? Explain. **04**  
(c) What are the objectives of Traffic System Management? **07**
- Q.2** (a) What do you understand by Level Of Service? Explain LOS for uninterrupted flow on rural highways. **03**  
(b) Explain PIEV Theory. **04**  
(c) Explain the classified traffic volume. What are the purposes of carrying out the classified traffic volume studies? **07**
- OR**
- (c) Explain the procedure of finding Highway Capacity. **07**
- Q.3** (a) Explain Basic capacity, Practical capacity and Possible capacity. **03**  
(b) Discuss advantage of Off street parking. **04**  
(c) Explain relationship between flow parameters (speed, flow and density). **07**
- OR**
- Q.3** (a) Derive the Greenshield's speed density model. **03**  
(b) Discuss advantage of On street parking. **04**  
(c) Explain Road user characteristics. **07**
- Q.4** (a) What are bottlenecks? What are its causes? **03**  
(b) Suggest methods to mitigate bottlenecks caused due to slow moving vehicles **04**  
(c) Explain cloverleaf interchange with neat sketch. **07**
- OR**
- Q.4** (a) What are the factor affecting LOS? **03**  
(b) Discuss Car following theory. **04**  
(c) Describe advantages and disadvantages of Rotary. **07**
- Q.5** (a) Discuss the bus bay lanes. **03**  
(b) What are the privative measures for accident? **04**  
(c) Explain shared ride as a tool of TSM. **07**
- OR**
- Q.5** (a) Explain the methods of traffic forecasting and describe any one in detail. **03**  
(b) Differentiate between Time mean speed and Space mean speed. **04**  
(c) Explain condition diagram and collision diagram. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160615****Date:17-12-2022****Subject Name:Traffic Engineering and Management****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

|            |   | <b>MARKS</b> |
|------------|---|--------------|
| <b>Q.1</b> | (a) Define: flow, AADT, journey speed   | <b>03</b>    |
|            | (b) Write the factors affecting PCU.  | <b>04</b>    |
|            | (c) Explain about various on street parking with layout.  | <b>07</b>    |
| <b>Q.2</b> | (a) Write advantages of traffic signals.  | <b>03</b>    |
|            | (b) Explain PIEV Theory.  | <b>04</b>    |
|            | (c) Explain about various methods of traffic volume survey.   | <b>07</b>    |
|            | <b>OR</b>   |              |
|            | (c) Draw fundamental diagram of traffic flow and brief explain.   | <b>07</b>    |
| <b>Q.3</b> | (a) Write functions of traffic islands.   | <b>03</b>    |
|            | (b) Write the uses of origin and destination survey.  | <b>04</b>    |
|            | (c) Explain about preventive measures for accidents.  | <b>07</b>    |
|            | <b>OR</b>   |              |
| <b>Q.3</b> | (a) Write static vehicular characteristics.   | <b>03</b>    |
|            | (b) The vehicle passes 1km length of road in 1 min, 2 min and 3 min time respectively. Find time mean speed and space mean speed. | <b>04</b>    |
|            | (c) Write the cases of bottlenecks and explain any one case with neat sketch.   | <b>07</b>    |
| <b>Q.4</b> | (a) Draw clover leaf interchange with notation.   | <b>03</b>    |
|            | (b) How theoretical capacity of highway is determined?  | <b>04</b>    |
|            | (c) Write advantages and disadvantages of rotary intersection.  | <b>07</b>    |
|            | <b>OR</b>   |              |
| <b>Q.4</b> | (a) Explain about tidal flow operations.  | <b>03</b>    |
|            | (b) Explain about traffic actuated signals.   | <b>04</b>    |
|            | (c) Explain about Webster's method.   | <b>07</b>    |
| <b>Q.5</b> | (a) Write purposes of travel time and delay study.  | <b>03</b>    |
|            | (b) Write short note on: Intelligent Transport System.  | <b>04</b>    |
|            | (c) Explain about various level of service with neat sketch.  | <b>07</b>    |
|            | <b>OR</b>   |              |
| <b>Q.5</b> | (a) What are needs of traffic forecasting?  | <b>03</b>    |
|            | (b) How accident reporting is carried out?  | <b>04</b>    |

- (c) A test car was used on a north – south road 0.75 km long, and the following data for the moving car was collected.

07

| North trip No. | Travel Time (min) | No. of vehicles met against | No. of vehicles overtaking test car | No. of vehicles overtaken by test car |
|----------------|-------------------|-----------------------------|-------------------------------------|---------------------------------------|
| 1              | 2.65              | 85                          | 1                                   | 0                                     |
| 2              | 2.70              | 83                          | 3                                   | 2                                     |
| 3              | 2.35              | 77                          | 0                                   | 2                                     |
| 4              | 3.00              | 85                          | 2                                   | 0                                     |
| 5              | 2.42              | 90                          | 1                                   | 1                                     |

| South trip No. | Travel Time (min) | No. of vehicles met against | No. of vehicles overtaking test car | No. of vehicles overtaken by test car |
|----------------|-------------------|-----------------------------|-------------------------------------|---------------------------------------|
| 1              | 2.33              | 110                         | 2                                   | 0                                     |
| 2              | 2.71              | 115                         | 0                                   | 2                                     |
| 3              | 2.48              | 120                         | 0                                   | 0                                     |
| 4              | 2.54              | 125                         | 1                                   | 1                                     |
| 5              | 2.16              | 105                         | 0                                   | 2                                     |

Calculate traffic volume, average travel time and space mean speeds in both directions.

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