

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code:2170613****Date:24-05-2024****Subject Name:Traffic Engineering****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

- Q.1** (a) Enlist various aspects of human vision which affect the road user. **03**
 (b) Justify the statement “Psychological factors of road users which affect in traffic operation. **04**
 (c) Explain the operating characteristics of vehicles. **07**

- Q.2** (a) Enlist static and dynamic characteristics of road vehicles to be considered in traffic engineering. **03**
 (b) A vehicle travelling at 40 kmph was stopped within 1.8 seconds after the application of the brakes. Determine the average skid resistance. **04**
 (c) Outline the home-interview method of conducting O & D studies. Mention the advantages and limitations of this method. **07**

OR

- (c) Write a short notes on “3-E’s” for road safety. **07**
- Q.3** (a) Define:- 1) Hourly volumes 2) Average annual daily traffic (AADT) 3) Average daily traffic (ADT) **03**
 (b) State the purposes of origin & destination studies. **04**
 (c) Indicate how the traffic volume data are presented and the results interpreted for use in traffic engineering design. **07**

OR

- Q.3** (a) Describe the purpose of spot speed study. **03**
 (b) Compare collision diagram and condition diagram with neat sketch. **04**
 (c) The table below summarises the field data collected through a traffic study for the spot speed. **07**

Speed class (kph)	No. of vehicles observed
10 – 14.9	3
15 – 19.9	10
20 – 24.9	21
25 – 29.9	31
30 – 34.9	54
35 – 39.9	43
40 – 44.9	21
45 – 49.9	10
50 – 54.9	5
55 – 59.9	2

Making use of this data, calculate the following:

- (i) Modal speed
- (ii) Median speed

- (iii) Time mean speed
- (iv) Speed to be used in geometric design
- (v) Speed for traffic regulation

- Q.4** (a) Enlist the factors on which PCU values depend? Discuss briefly. **03**
(b) Write short notes on “Road marking materials”. **04**
(c) Draw the important types of warning signs and mention the function of each. **07**

OR

- Q.4** (a) List the various geometric elements to be considered in highway design. **03**
(b) Describe the various factors to be considered during the design of traffic signal timings **04**
(c) Explain warrants for installation of traffic control signal. **07**

- Q.5** (a) Write the advantages and limitations of a traffic rotary, In particular reference to traffic conditions in India. **03**
(b) Explain the objects of highway lighting? Explain silhouette & reverse silhouette. **04**
(c) Explain the various factors to be considered in the design of road lighting. **07**

OR

- Q.5** (a) Draw the different types of interchanges and mention their advantages. **03**
(b) Draw sketches of lighting layouts for a) horizontal curves of highway and b) intersections. **04**
(c) Draw a neat sketch of a a) partial cloverleaf and b) fully cloverleaf and show the movement of traffic & describe its limitations. **07**
