



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY SPECIAL / SUPPLEMENTARY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

THIRD YEAR FIRST SEMESTER EXAMINATIONS

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN CIVIL AND STRUCTURAL
ENGINEERING**

COURSE CODE: CSE 341

COURSE TITLE: TRAFFIC ENGINEERING

DATE: 28TH JULY 2022 TIME: 11 A.M. – 1 P.M.

INSTRUCTIONS:

1. This paper contains Four questions
2. Answer Question 1 and any other two
3. Marks for each question are indicated in the parenthesis.
4. Examination duration is **2 Hours**

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

Question 1 (30 marks): COMPULSORY

- a) With the help of an appropriate fundamental traffic flow diagram describe the relationship between speed and density. **(5 marks)**
- b) What is an axle load **(3 marks)**
- c) Describe three methods that can be used to measure axle loads **(3 marks)**
- d) Traffic assignment is the last step of the 4-step model of travel demand modeling. Mention and briefly describe any three methods used in traffic assignment. **(9 marks)**
- e) Considering the four by four base year trip matrix below. Determine the future estimated trip matrix where the growth factor is 1.2 using **(10 marks)**
 - a. Uniform growth factor method
 - b. Singly constrained growth factor method- origin constrained
 - c. Doubly constrained growth factor.

	1	2	3	4	Σj
1	5	50	100	200	355
2	50	5	100	300	455
3	50	100	5	100	255
4	100	200	250	200	570
Σi	205	355	455	620	1635

Question 2: (20 marks)

- a) What is the importance of traffic forecasting **(3 marks)**
- b) Traffic grows from time to time. Explain 5 factors that contribute to the growth in traffic **(7 marks)**
- c) Data collection methods can be broadly categorized into in-situ methods and floating car data (FCD) methods. Briefly describe any two from each category **(4 marks)**
- d) The capacity of any given highway is limited by certain factors. Name and describe any three **(6 marks)**

Question 3: (20 marks)

- a) There are four major indices to describe parking utilization. Define them giving the appropriate mathematical formulation where necessary. **(10 marks)**
- b) There are two mathematical formulations for determination of trip generation model. Describe them giving the appropriate formula and also mention the main difference between them **(10 marks)**

Question 4: (20 marks)

- a) There are different types of on-street parking. Mention any 3 stating their advantages and disadvantages (you can use simple sketches to illustrate the differences). **(9 marks)**
- b) Define level of service **(1mark)**
- c) Using the example of Kakamega town and based on the four-step model, briefly explain how you can go about developing a model to estimate the 10-year travel demand of the town. **(10 marks)**