



*(University of Choice)*

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

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2019/2020 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER EXAMINATIONS**

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

**COURSE CODE: CSE 441**

**COURSE TITLE: TRANSPORTATION ENGINEERING**

**DATE: FRIDAY 17<sup>TH</sup> JANUARY 2020 TIME: 12.00 – 2.00 PM**

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**INSTRUCTIONS:**

1. This paper contains FOUR questions
2. **Question One IS COMPULSORY**
3. Attempt any other Two questions
4. Marks for each question are indicated in the parenthesis.

Examination duration is **2 Hour**

MMUST observes ZERO tolerance to examination cheating

*This Paper Consists of 3 Printed Pages. Please Turn Over.*

**Question ONE (30 marks)**

- a) Explain FOUR types of traffic volume measurements [4 marks]
- b) Explain the following types of speed as used in traffic engineering [5 marks]
- i. Spot speed,
  - ii. Running speed,
  - iii. Journey speed,
  - iv. Time mean speed
  - v. Space mean speed.
- c) Describe the three types of parking Surveys [6 marks]
- d) Discuss the road users characteristics in traffic engineering [6 marks]
- e) With an aid of a sketch describe the components of a permanent way in railway engineering [6 marks]
- f) Explain the three major characteristics of labor based technology [3 Marks]

**Question TWO (20 marks)**

Discuss the highway location survey and design process for a new rural highway [20 marks]

**Question THREE (20 marks)**

- a) Describe the following visual factors providing a sample driving task for each. [8 Marks]
- 1) Accommodation
  - 2) Dynamic Visual Acuity
  - 3) Contrast sensitivity
  - 4) Eye movement
  - 5) Vergence
  - 6) Peripheral vision
  - 7) Angular movement
  - 8) Movement in depth
- b) The parking survey data collected from a parking lot by license plate method is shown in the table below. Find the average occupancy, average turnover, parking load, parking capacity and efficiency of the parking lot

Bay	Time			
	0-15	15-30	30-45	45-60
1	1456	9813	-	5678
2	1945	1945	1945	1945
3	3473	5463	5463	5463
4	3741	3741	9758	4825
5	1884	1884	-	7594
6	-	7357	-	7893
7	-	4895	4895	4895
8	8932	8932	8932	-
9	7653	7653	8998	4821
10	7321	-	2789	2789
11	1213	1213	3212	4778
12	5678	6678	7778	8888

[12 Marks]

**Question FOUR (20 marks)**

- a) What are the advantages of concrete sleepers over other types of sleepers [6 Marks]
- b) Describe the elements of transportation [6 marks]
- c) Outline the functions of ballast in a railway track [8 Marks]