



TECHNICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:  
**BACHELOR OF SCIENCE IN CIVIL ENGINEERING**

ECE 2411: TRAFFIC ENGINEERING II

**SPECIAL/SUPPLEMENTARY EXAMINATION**

**SERIES: MARCH 2014**

**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer question **ONE (Compulsory)** and any **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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**Question One (Compulsory)**

- a) Briefly describe the **THREE** types of “shock waves” that occur in a traffic stream. **(6 marks)**
- b) Differentiate the following terms used in traffic flow:  
(i) Spacing and clearance  
(ii) Volume and flow rate  
(iii) Headway and Gap **(9 marks)**
- c) Describe the interrupted and uninterrupted traffic flow. **(6 marks)**

d) Briefly describe the THREE main approaches in traffic flow studies. (6 marks)

e) What is Road hierarchy? (3 marks)

### Question Two

a) Differentiate between centrally and individually controlled modes of transport. (6 marks)

b) Describe the “stationery flow” phenomenon in a traffic stream. (8 marks)

c) Name FOUR components constituting minimum spacing between two successive vehicles in a traffic stream. (6 marks)

### Question Three

a) Describe the following factors affecting driving:

(i) Vehicle characteristics

(ii) Driver characteristics

(6 marks)

b) (i) Briefly explain the Queuing Theory in traffic engineering. (4 marks)

(ii) Outline the main causes of queuing in a traffic stream. (4 marks)

c) Describe the following terms used in traffic flow:

(i) Headway (h)

(ii) Spacing (s)

(iii) Gap (g)

(iv) Clearance (c)

(8 marks)

### Question Four

a) Briefly explain “connectivity in transportation networks” (4 marks)

b) With the aid of sketches, describe a four stage idealized sequence of transport network.

(6 marks)

c) Explain the following methods of traffic assignment in a given network.

(10 marks)

(i) All or nothing

(ii) Capacity resistant

(iii) Incremental assignment

### Question Five

a) Explain the term “Trip Assignment” with illustrations. (6 marks)

b) A link 1km long has a practical capacity of 45,000 vehicles/day and a speed of 45kph. The travel time at that volume is 1.5 minutes (zero flow). Calculate the number of vehicles per day assigned to it after the link is loaded (10 marks)

c) Outline the main objectives of a Road hierarchy. (4 marks)