



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

## Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

BACHELOR OF ENGINEERING IN BUILDING & CIVIL ENGINEERING  
(BEBC)

**[Institutional Based Programmes]**

EBC 4414: TRANSPORTATION ENGINEERING

**END OF SEMESTER EXAMINATION**

**SERIES: DECEMBER 2012**

**TIME: 2 HOURS**

### **Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

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### **Question One (30 marks)**

a) Briefly describe the **THREE** attributes that are used to evaluate transportation systems.

**(6 marks)**

b) In reference to the physical plan of most transportation systems, briefly describe the following properties of the environment that have direct impact on human behavior:-

- (i) Circulation and movement
  - (ii) Ambience
  - (iii) Resources
  - (iv) Spatial organization
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(v) Communications (10 marks)

c) Explain the **FOUR** basic elements that constitute the physical plan of most transportation systems. (6 marks)

d) Briefly describe the following planning tools used in travel demand forecasting.

(i) Sketch planning tools

(ii) Traditional tools (8 marks)

### Question Two (20 marks)

a) (i) Briefly explain the nature of transportation demand. (5 marks)

(ii) With the aid of a flow chart, briefly describe the sequential “decision making” of a trip maker.

(5 marks)

b) (i) Briefly explain the nature and purpose of trip generation models. (6 marks)

(ii) Describe the ‘regretion model’ used in trip generation studies. (4 marks)

### Question Three (20 marks)

a) With the aid of sketch describe a typical hierarchical urban area street distribution. (9 marks)

b) Briefly describe **THREE** primary factors that must be studied before embarking on a transit system.

(4 marks)

c) (i) State the **THREE** conditions that explain why people and goods move from one place to another.

(3 marks)

(ii) With the aid of a sketch explain the connection between land use and transportation.

(4 marks)

### Question Four (20 marks)

a) Briefly explain the objectives of designing transit networks. (4 marks)

b) With the aid of sketches, describe the **FOUR** types of transit networks. (16 marks)

### Question Five (20 marks)

a) Briefly describe how the data for the following traffic characteristics are collected:-

(i) Speed data

(ii) Density data

(iii) Volume or flow rate data.

(9 marks)

b) With the aid of typical plots briefly explain how speed, density and flow rate in uninterrupted streams are related. (6 marks)

c) (i) Describe the ‘car behaviour’ encountered in a traffic. (2 marks)

(ii) State **THREE** features of car following behavior. (3 marks)