



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN ENGINEERING

ECE 2318: TRANSPORTATION ENGINEERING I

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

TIME: 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)** from **SECTION A** and any other **TWO** questions from **SECTION B**

Maximum marks for each part of a question are clearly shown

This paper consists of **TWO** printed pages

SECTION A (COMPULSORY)

Question 1 (30 marks)

- a) (i) Explain what transportation engineering is (5 marks)
- (ii) With the aid of a flow chart describe the transportation policy making process (5 marks)
- (iii) State the **FOUR** basic elements that make up the physical plant of most transportation systems (4 marks)
- b) Name and describe the three basic attributes used to evaluate transportation systems (7 ½ marks)
- c) (i) With the aid of a sketch, describe a typical hierarchical urban area street distribution. (6 marks)
- (ii) Name **FIVE** categories of human behavior that are affected by transportation (2 ½ marks)

SECTION B (Attempt any TWO questions)

Question 2 (20 marks)

- a) Briefly describe how the data for the following traffic characteristics are collected:
- (i) Speed data.
 - (ii) Density data
 - (iii) Flow or volume data
- (9 marks)
- b) With the aid of typical plots, briefly explain how speed, density and flow in uninterrupted streams are related
- (6 marks)
- c) (i) Describe the 'car following behavior encountered in traffic streams. (2 marks)
(ii) State **THREE** features of car-following behavior (3 marks)

Question 3 (20 marks)

- a) (i) Briefly explain the objectives in designing of transit networks (3 marks)
(ii) With the aid of sketches, describe the **FOUR** types of transit networks (12 marks)
- b) Outline the **THREE** primary factors that should be identified and studied before embarking on a transit project (5 marks)

Question 4 (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 'regression model' used in trip generation studies (4 marks)

Question 5 (20 marks)

- a) Name and briefly describe the **THREE** planning tools used in travel forecasting (7½ marks)
- b) Explain the purposes of the following tasks carried out to assist in forecasting travel demand for a given area
- (i) Defining the boundaries
 - (ii) Subdividing the area for forecasting
- (5½ marks)
- c) (i) Briefly describe the 'destination choice models' (5 marks)

(ii) Name **FOUR** factors that affect travel in urban areas

(2 marks)