THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

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

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE CIVIL ENGINEERING

ECE 2411: TRAFFIC ENGINEERING II

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

a) Briefly describe the **THREE** main approaches used in traffic flow studies (6 marks)

b) Differentiate between the following:
(i) Spacing and clearance
(ii) Volume and flow rate
(iii) Headway and gap (8 marks)

c) (i) Briefly describe the 'moving vehicle estimation method' used to estimate the speed and flow of traffic in a stream (5 marks)

(ii) With the aid of a sketch, explain how the behavior of an individual vehicle in stream can be examined. (5 marks)

SECTION B (Answer any TWO questions from this section)

Question 2

a) Describe the 'stationary flow' phenomenon in a traffic stream (8 marks)

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

c) Briefly describe the Green shield's model of traffic flow. (4 marks)

d) Name **FOUR** components that constitute the minimum spacing between two successive vehicles in a traffic stream (2 marks)

Question 3

a) Briefly explain what a road hierarchy is. (3 marks)

b) (i) Outline the main objectives of a road hierarchy (2 marks)
(ii) State **FOUR** ways in which a hierarchy principles assist planning agencies in the development of policies relating to management of roads (4 marks)

c) Briefly describe the **FOUR** main functional levels of a road hierarchy in relation to land use. (11 marks)

Question 4

a) With the aid of a sketch, explain the movement of traffic in a four legged unsignalised intersection (6 marks)

b) Describe the following factors that affect driving:
(i) Motor vehicle characteristics
(ii) Driver characteristics (6 marks)

c) (i) Briefly explain the queuing theory as applied in traffic engineering (2 marks)

(ii) Outline the causes of queuing in a traffic stream (2 marks)

(iii) Briefly describe the **THREE** main features that contribute to formation of a queue in a given intersection (4 marks)

Question Five

a) (i) Briefly explain 'connectivity' as used in transportation networks (4 marks)

(ii) With the aid of sketches, describe a four stage idealized sequence of transport network development. (6 marks)

b) Explain the following methods used to assign traffic in given networks.
(i) All or nothing
(ii) Capacity resistant
(iii) Incremental assignment (10 marks)