THE TECHICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECE 2521: TRANSPORTATION & LAND-USE URBAN AND REGIONAL PLANNING

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: FEBRUARY 2013
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*
- *Pocket Calculator*

This paper consists of **FIVE** questions.
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One (Compulsory)

a) In respect to transportation and land-use, briefly explain the 'planning process' **(5 marks)**

b) Explain the following terms used in transportation and land use in urban areas:
- **(i)** Urban interaction
- **(ii)** Comprehensive plan
- **(iii)** Zoning
- **(iv)** Urban spatial structure
- **(v)** Infrastructure **(10 marks)**

c) Describe the urbanization process and how it affects other urban structures such as infrastructure and urban service. **(15 marks)**

Question Two

a) With the aid of a flow chart, explain the bond between transportation and land-use. **(8 marks)**

b) Briefly describe 'location theory' as used in urban planning. **(8 marks)**

c) In relation to land use and transportation explain why urban areas grow or decline in time. **(4 marks)**

Question Three

a) (i) Briefly describe the various classes in which land-use models are divided. **(7 ½ marks)**

(ii) Explain the nature of transportation demand. **(6 ½ marks)**

b) In relation to transportation systems describe the following types of transportation models:
(i) Centrally controlled models
(ii) Individually controlled modes **(6 marks)**

Question Four

a) Explain the relationship between transportation and land development. **(8 marks)**

b) With the aid of a flow chart describe 'transportation within the urban systems' **(8 marks)**

c) Explain the following systems used in transportation:
(i) Freeway management systems
(ii) Incident management systems
(iii) Route guidance systems
(iv) Emergency response systems **(4 marks)**

Question Five

a) (i) State the **THREE** essential components of transportation. **(3 marks)**

(ii) With the aid of a sketch explain the interaction between the **THREE** components in (a) (i) above. **(7 marks)**

b) Explain the following terminologies used in transportation:
(i) Supply
(ii) Demand
(iii) Equilibrium **(3 marks)**

c) Outline the steps followed in the 'density-saturation gradient method' to estimate land-use. **(7 marks)**