



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

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

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2012

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) (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) (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)**
- c) In relation to transportation, describe the following types of transportation modes:
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- (i) Centrally controlled modes
- (ii) Individually controlled modes. **(6 marks)**

Question Two

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

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

- c) 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)**

Question Three

- a) Explain the “Planning Process” as used in transportation and land-use. **(5 marks)**
- b) Describe the urbanization process and how it affects other urban structures such as infrastructure and urban service. **(15 marks)**

Question Four

- a) With the aid of a flow chart, describe transportation within the urban system. **(8 marks)**

- b) Briefly describe the ‘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.

Question Five

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

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

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