TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING
(BSCE Y3 S2)

ECE 2318: TRANSPORTATION ENGINEERING

END OF SEMESTER EXAMINATION
SERIES: APRIL 2014
TIME ALLOWED: 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
All questions carry equal marks
Maximum marks for each part of a question are as shown
This paper consists of**TWO** printedpages

Question One (COMPULSORY)

a) There are FOUR dilemas encountered in the design of transportation networks. Name and explain them. **(20 marks)**

b) (i) Explain what transportation engineering is. **(5 marks)**

(ii) With the aid of a flow chart describe the transportation policy making process. **(5 marks)**

Question Two

One of the methods used to collect traffic volume or flow data is the moving observer method. Using this method show that:

$$q = \frac{M_a + M_w}{T_a + T_w}$$

Where:
q = flow or volume

M_a and M_w is vehicles

T_a and T_w is time **(20 marks)**

Question Three

a) In transportation engineering one of the methods used to collect density data is the use of presence type detectors. In referee to this show that the density:

$$K = \frac{O_C}{V_L + D_L}$$

where: O_c = fraction of time the detector is occupied
V_L = Length of the vehicle
D_L= Length of the detector **(15 marks)**

b) In the context of public transportation explain 'bundling'. Support your explanation with a sketch. **(5 marks)**

Question Four

a) (i) With the aid of a flow chart, explain the transportation policy making process. **(6 marks)**

(ii) Name and briefly describe the FOUR basic elements that constitute the physical plan of most transportation system. **(8 marks)**

b) In relation to transportation decision making, describe the 'sequential demand analysis' **(6 marks)**

Question Five

Name and describe the FIVE steps in which decisions relating to design of transportation networks are made. **(20 marks)**