TECHNICAL UNIVERSITY OF MOMBASA

UNIVERSITY SUPPLEMENTARY EXAMINATIONS

2016/2017 ACADEMIC YEAR

THIRD YEAR EXAMINATIONS

FOR THE DEGREE OF

BACHELOR OF SCIENCE

IN

CIVIL ENGINEERING

COURSE CODE: ECE 2318

COURSE TITLE: TRANSPORTATION ENGINEERING I

TIME: 2 HRS

INSTRUCTIONS TO CANDIDATES

- *THIS PAPER CONTAINS FOUR QUESTIONS*
- *ANSWER QUESTIONS ONE ANY OTHER TWO QUESTIONS*
- *MARKS TO QUESTIONS ARE AS SHOWN*
- *DO NOT USE A PROGRAMMABLE CALCULATOR*
- *NO MOBILE PHONES ALLOWED IN THE EXAMINATION ROOM*

THIS PAPER CONSISTS OF (4) PRINTED PAGES

QUESTION ONE

a) Outline the SIX steps in the travel forecasting process   (12marks)

b) State THREE factors that influence the demand for urban travel   (3marks)

c) i)   Explain the term 'mode choice'

   ii) Enumerate the THREE types of transit estimating procedures used depending upon the level of transportation detail required   (6marks)

d) Having identified the desired survey population and selected a sampling unit, it is necessary to obtain a sampling frame from which to draw the sample. Outline FOUR deficiencies that these sampling frames suffer from.   (6 marks)

e) Distinguish between a simple random sampling and stratified random sampling types of sampling methods   (3 marks)

QUESTION TWO

a)   Outline FOUR uses of transport demand models   (6 marks)

b)   Prior to collecting and summarizing data for urban transportation forecasting process, it is usually necessary to delineate the study area boundaries and to further subdivide the area into traffic analysis zones (TAZ) for these zones is based on.   (4 marks)

c)   State the SEVEN criteria that selection of traffic analysis zones is based on   (7marks)

d)   Outline the functions of trip generation   (3marks)

c

QUESTION THREE.

a) Outline the following data collection techniques;
   i)   Observation technique
   ii) Interview technique   (12 marks)

b) Enumerate the advantages and possible constraints of the techniques in (a) above
                                                                            (8 marks)

QUESTION FOUR

a) To determine a representative value for ADT on 100 highway links that have similar volume characteristics, it was decided to collect 24-hour volume counts on a sample of these links. Estimates of mean and standard deviation of the link volumes for the type of highways in which these links are located are 32,500 and 5,500 respectively. Determine the minimum number of stations at which volume counts should be taken if a 95-5 precision level is required with 10% allowable error. (9 marks)

b) Outline types of periodic volume counts (6 marks)

c) State FIVE logistical impacts of intermodal facilities. (5 marks)

Table A.1   Level of Significance for One-Tailed Test (*continued*)

	.250	.100	.050	.025	.010	.005	.0025	.0005
	Level of Significance for a Two-Tailed Test							
Degrees of Freedom	.500	.200	.100	.050	.020	.010	.005	.001
22.	.686	1.321	1.717	2.074	2.508	2.819	3.119	3.792
23.	.685	1.319	1.714	2.069	2.500	2.807	3.104	3.768
24.	.685	1.318	1.711	2.064	2.492	2.797	3.091	3.745
25.	.684	1.316	1.708	2.062	2.485	2.787	3.078	3.725
26.	.684	1.315	1.706	2.056	2.479	2.779	3.067	3.707
27.	.684	1.314	1.703	2.052	2.473	2.771	3.057	3.690
28.	.683	1.313	1.701	2.048	2.467	2.763	3.047	3.674
29.	.683	1.311	1.699	2.045	2.462	2.756	3.038	3.659
30.	.683	1.310	1.697	2.042	2.457	2.750	3.030	3.646
35.	.682	1.306	1.690	2.030	2.438	2.724	2.996	3.591
40.	.681	1.303	1.684	2.021	2.423	2.704	2.971	3.551
45.	.680	1.301	1.679	2.014	2.412	2.690	2.952	3.520
50.	.679	1.299	1.676	2.009	2.403	2.678	2.937	3.496
55.	.679	1.297	1.673	2.004	2.396	2.668	2.925	3.476
60.	.679	1.296	1.671	2.000	2.390	2.660	2.915	3.460
65.	.678	1.295	1.669	1.997	2.385	2.654	2.906	3.447
70.	.678	1.294	1.667	1.994	2.381	2.648	2.899	3.435
80.	.678	1.292	1.664	1.990	2.374	2.639	2.887	3.416
90.	.677	1.291	1.662	1.987	2.368	2.632	2.878	3.402
100.	.677	1.290	1.660	1.984	2.364	2.626	2.871	3.390
125.	.676	1.288	1.657	1.979	2.357	2.616	2.858	3.370
150.	.676	1.287	1.655	1.976	2.351	2.609	2.849	3.357
200.	.676	1.286	1.653	1.972	2.345	2.601	2.839	3.340
∞	.6745	1.2816	1.6448	1.9600	2.3267	2.5758	2.8070	3.2905