MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY ORDINARY EXAMINATION

2018/2019 ACADEMIC YEAR

THIRD YEAR **SECOND** SEMESTER EXAMINATION FOR, DIPLOMA IN CIVIL ENGINEERING

SEB 1361 - ENGINEERING MATHEMATICS VI

DURATION: 2 HOURS

DATE: 18/12/2018

TIME: 9 – 11 A.M.

Instructions to candidates:

1. Answer question One and Any Other Two questions.

2. Mobile phones are not allowed in the examination room.

3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION
QUESTION ONE (30 MARKS)

a. Define the following;

    i.   Population (2 Marks)

    ii.   Sample (2 Marks)

   iii.   Harmonic mean (2 Marks)

   iv.   Interquartile (2 Marks)

    v.   Correlation (2 Marks)

b. Determine the coefficient and correlation between the use of fertilizer and productivity from the following data and comment on the value (10 Marks)

Production (Tones)	15	18	20	30	35	40	45
Fertilizer (Tones)	85	93	95	120	130	150	160

c. Estimate the Mode and Median of the following distribution: (10 Marks)

x	Frequency	Cumulative Frequency
9.3 – 9.7	2	2
9.8 – 10.2	5	7
10.3 – 10.7	12	19
10.8 – 11.2	18	31
11.3 – 11.7	14	51
11.8 – 12.2	6	57
12.3 – 12.7	4	61
12.8 – 13.2	1	62

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

A basket contains 100 apples and lemons, 75 fruits are big while the rest are small. There are 80 apples of which 72 are big. Find the probability of randomly picking:

  i.   A big fruit given that it is an apple
 ii.   A small fruit given that it is an apple
iii.   A fruit that is lemon and is small in size
 iv.   A fruit that is an apple and big in size
  v.   A fruit that is a lemon and big in size
 vi.   A fruit that is an apple and small in size   (20 Marks)

QUESTION THREE (20 MARKS)

The time taken by employees to complete an operation was recorded on 80 occasions:

Time (Min)	10.0	10.5	11.0	11.5	12.0	12.5	13
Frequency	4	8	14	22	19	10	3

a. Determine the following from the set of observation:
   i.   The mean
  ii.   The standard deviation
 iii.   The mode
  iv.   The median
b. State:
   i.   The class interval
  ii.   The lower boundary of the third class
 iii.   The upper boundary of the seventh class   (20 marks)

QUESTION FOUR (20 MARKS)

a. Determine the Karl Pearson coefficient of correlation for the following scores.

X	23	27	28	28	28	30	30	33	35	38
Y	18	20	22	27	21	29	27	29	28	29

(10 Marks)

b. The data below regards salaries of a group of six persons and their respective expenditures. Find regress expenditure on salaries. (10 marks)

Salary	50	70	100	80	65	40
Expenditure	20	15	80	80	45	51