MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

CERTIFICATE IN BRIDGING MATHEMATICS

CITY CAMPUS

MMA 003: PROBABILITY AND STATISTICS

Date: 23rd November, 2016 **Time:** 2.00 – 5.00pm

INSTRUCTIONS:

- Attempt Question ONE (Compulsory) and any other TWO.

QUESTION ONE (Compulsory) [30 Marks]

(a) Differentiate between:

(i) statistic and probability. [2 Marks]

(ii) event and outcome. [2 Marks]

(b) State any three ways of presenting data. [3 Marks]

(c) If one has three dice, what is the probability of:

(i) getting three 1s if he threw them at the same time? [2 Marks]

(ii) getting two 4s and one 3, if he threw them at the same time? [2 Marks]

(d) Consider the following distribution:

18, 16, 17, 14, 19, 18, 18, 16, 17, 16, 18, 19

(i) Determine mean, mode and median of the data. [5 Marks]

(ii) Determine the interquartile range of the data [4 Marks]

(e) State one shortcoming of using the following for data presentation:

(i) simple dot plot. [1 Mark]

(ii) jittered dot plot. [1 Mark]

(f) If you draw three times from a deck of cards, one after the other, what is the probability that you will select at least two black cards if you are not returning the cards? *(A deck contains 52 cards, half of which are black.)* [4 Marks]

(g) The following list shows milk fat content from ten cows in a herd.

3.460, 3.417, 3.462, 3.790, 2.973, 2.875, 2.653, 3.796, 3.127, 2.873

Draw a stem and leaf plot of the milk fat content. [4 Marks]

QUESTION TWO [20 Marks]

The weights in kilograms of students in a class of twenty are given below:

44, 43, 46, 35, 65, 32, 43, 45, 45, 39, 56, 41, 50, 61, 49, 36, 45, 48, 45, 67

(a) Obtain:

(i) Stem and leaf plot of the data. [3 Marks]

(ii) Mean [2 Marks]

(iii) Mode [1 Mark]

(iv) Median [2 Marks]

(v) Interquartile range [4 Marks]

(vi) Standard deviation [5 Marks]

(b) Use the rule of thumb to analyse the data. [3 Marks]

QUESTION THREE [20 Marks]

The data below gives the total annual rainfall for Mombasa region.

Year	Total Rainfall (mm)
2002	764
2003	671
2004	640
2005	480
2006	735
2007	492
2008	320
2009	473
2010	516
2011	794
2012	1002
2013	647
2014	580
2015	772

(a) Present it in a line graph. [4 Marks]

(b) Find their moving averages of order two and three, and hence graph them. [16 Marks]

QUESTION FOUR [20 Marks]

(a) Differentiate between:

(i) mutually inclusive and mutually exclusive events. [2 Marks]

(ii) dependent and independent events. [2 Marks]

(b) If one picks three balls from a bag containing six white and four red balls,

(i) What is the probability that all the three balls are of the same colour:

I. If a ball is returned to the bag after being picked. [4 Marks]

II. If a ball is not returned to the bag after being picked. [4 Marks]

(ii) What is the probability that two balls are of the same colour:

I. If a ball is returned to the bag after being picked. [4 Marks]

II. If a ball is not returned to the bag after being picked. [4 Marks]

QUESTION FIVE [20 Marks]

In a certain class with twenty-two students, the students were asked how many times they had visited the Bomas of Kenya. They gave the following responses.

0, 8, 4, 0, 8, 1, 6, 3, 7, 3, 4, 2, 0, 1, 1, 3, 9, 6, 10, 0, 7, 1

(a) Find the frequency distribution of the number of times the students had visited the Bomas of Kenya. [6 Marks]

(b) Draw a stacked dot plot to represent the data. [4 Marks]

(c) Present the data using a histogram. [4 Marks]

(d) Obtain the standard deviation. [6 Marks]