MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE CERTIFICATE IN BRIDGING MATHEMATICS

(CITY CAMPUS-REGULAR)

MMA 003: PROBABILITY AND STATISTICS

Date: 2nd December, 2015 **Time:** 2.00 – 4.00 pm

INSTRUCTIONS:

- Answer question ONE and any other TWO questions.

QUESTION ONE (Compulsory) [30 Marks]

(a) Differentiate between:

(i) probability and outcome. [2 Marks]

(ii) event and compound event. [2 Marks]

(b) Name three methods of data collection. [3 Marks]

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

(i) getting three 4s if he threw them at the same time? [2 Marks]

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

(d) Consider the following distribution:

$$8, 6, 7, 4, 9, 8, 8, 6, 7, 6, 8$$

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

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

(e) Differentiate between continuous numerical data and discrete numerical data. [2 Marks]

(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 red cards if you are not returning the cards? *(A deck contains 52 cards, half of which are red.)* [4 Marks]

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

$$3.460, 3.317, 3.212, 2.790, 2.973, 2.875, 2.653, 3.376, 3.127, 2.853$$

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:

$$44, 45, 42, 43, 46, 34, 65, 32, 43, 45, 45, 37, 56, 41, 49, 61, 49, 36, 45, 48$$

(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 Kisumu region.

Year	Total Rainfall (mm)
2002	664
2003	871
2004	846
2005	580
2006	645
2007	394
2008	636
2009	473
2010	716
2011	894
2012	988
2013	577
2014	889

(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 blue 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]

(i) 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 students, the students were asked how many times they had visited the Port of Mombasa. They gave the following responses.

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

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

(b) Draw a jittered dot plot of the data. [4 Marks]

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

(d) Obtain the variance of the data. Hence find the standard deviation. [6 Marks]