(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2016/2017 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER

SPECIAL/ SUPPLEMENTARY EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE

MATHEMATICS

COURSE CODE: STA 210

COURSE TITLE: PROBABILITY AND STATISTICS

DATE: 28/09/17 **TIME:** 8 AM -10 AM

INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other TWO Questions

TIME: 2 Hours

This Paper Consists of 4 Printed Pages. Please Turn Over.

QUESTION ONE (30 MARKS)

1. (a) Explain the meaning of the following terms as used in probability and statistics: Exhausitive events, Favourable events, Skewness, Kurtosis (4 mks)

   (b) An experiment has only two outcomes. The first has probability p to occur, the second probability p^2. What is p? (3 mks)

   (c) State any two advantages of using range as a measure of dispersion. (2 mks)

   (d) A batch of 15 test tubes contains 3 test tubes that are defective. If 2 test tubes are selected at random, what is the probabilty that at least one of them is not defective? (4 mks)

   (e) The mean of marks obtained by 300 candidates in Chemisty is 48. The mean of the top 100 of them was found to be 75 and the mean of the last 100 was found to be 20. What is the mean of the remaining 100 candidates? (3 mks)

   (f) Suppose a six sided fair die was tossed two times. What is the probability of getting

      i. a 4 in two occations (3 mks)

      ii. a sum of 4,5 or 6 (3 mks)

   (g) If A and B are any two events in S, show that

      i. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ (4 mks)

      ii. $P(A \backslash B) = P(A) - P(A \cap B)$ (4 mks)

QUESTION FOUR (20 MARKS)

4. (a) State four characteristics of an ideal measure of dispersion (4 mks)

(b) County income statistics for three years are given in the table below

Year	Agriculture	Industry	Other sectors	Total
2015	170	90	80	340
2016	190	120	90	400
2017	200	140	120	460

From the information, draw

i. a simple bar chart (2 mks)

ii. a component bar chart (3 mks)

iii. a multiple bar chart (3 mks)

(c) Calculate the coefficient of skewness and explain what it means for the following distribution (8 mks)

Capitalization	Number of companies
$0 \leq x < 10$	10
$10 \leq x < 20$	17
$20 \leq x < 30$	19
$30 \leq x < 40$	27
$40 \leq x < 50$	19
$50 \leq x < 60$	8

QUESTION FIVE (20 MARKS)

5. (a) Study the data below and use it to answer the questions that follows

MARKS	0-10	10-20	20-30	30-40	40-50
No. OF STUDENTS	3	7	11	6	4

i. Compute Geometric mean (3 mks)

ii. Determine the value of the mode graphically (3 mks)

iii. Construct the more than and less than cumulative frequency curves (4 mks)

(b) Suppose there are three apparatus A, B and C used to measure exact volume in a Chemistry laboratory, it is estimated from a survey done in the laboratory that 20 percent of the students know how to use apparatus A, 16 percent use B, 14 percent use C, 8 percent use A and B, 5 percent B and C, 5 percent use A and C and 2 percent use all the apparatus. What is the probability that a randomly chosen person

i. does not use any of the apparatus? (2 mks)

ii. does not use C? (2 mks)

iii. uses A but not B? (3 mks)

iv. uses only two of these apparatus? (3 mks)