MURANGA UNIVERSITY COLLEGE

(A constituent College of Jomo Kenyatta University of Agriculture & Technology)

MAIN/TOWN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE

OF

BACHELOR OF COMMERCE

COURSE CODE: HBC2110

COURSE TITLE: INTRODUCTION TO BUSINESS STATISTICS

DATE: 18TH AUGUST 2015 **TIME: 2 HOURS**

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer any other TWO (2) questions

QUESTION ONE (30 MARKS).

(a) Mention five points to be considered when designing a questionnaire. (5marks).

(b) The average weekly salary for a group of 25 persons working in a factory was calculated to be Shs. 3,784. It was later discovered that one figure was misled as 1600 instead of the correct value Shs. 2,000. Calculate the average wage. (4marks)

(c) Two types of new cars produced in South Africa are tested for patrol mileage. One group consisting of 36 cars averaged 14kms per litre with a variance of 1.5 while the other group consisting of 72 cars averaged 12.5 kms per litre with a variance of 2.0. Test whether there exists a significant difference in the petrol consumption of those two types of cars. (5marks)

(d) A manufacturing company owns three packaging machines namely X, Y and Z. The probabilities of using the machines in packaging are ½ , 1/6 and 1/3 for machines X, Y and Z respectively. Past experience shows that the probabilities of obtaining a defective item from the output produced by the machines X, Y and Z respectively

(i) Draw a probability tree representing the possible outcomes. (3marks).
Calculate

(ii) The probability that an item selected at random from the production ran was defective (2marks).

(iii) The probability that an item selected at random from the production run was from machine Z given that the item was not defective. (3marks)

(e) The table below shows the quantities of four types of cereals consumed by a certain household in the years 2010 and 2011 and the unit price for each type of cereal.

Type of Cereal	2010		2011	
	Price per Kg in sh.	Quantity (Kg)	Price per Kg in sh.	Quantity (Kg)
Maize	50	100	80	120
Rice	80	140	100	120
Beans	40	150	80	110
Peas	50	100	90	100

Using year 2010 as the base year, calculate Fisher's Ideal Price Index number. (8marks).

QUESTION TWO (2 MARKS).

(a) The data below shows the distribution of profits realized by 1000 Petrol Station outlets, within Nairobi for the financial year ended 30th June, 2015.

Profits (Sh. Million)	**Frequency**
80 – 96	17
96 – 112	53
112 - 128	199
128 – 144	194
144 – 160	327
160 – 176	208
176 – 192	2

(i) Calculate the mean annual profit. (4marks).

(ii) The co-efficient of variation. (5marks).

(b) Mention five factors to be considered when constructing index numbers. (5mks).

(c) Of the 1,000 workers in a factory exposed to an epidemic, 700 in all were attacked, 400 had been inoculated and ofthese, 200 were attacked. On the basis of this information can it be said that inoculation and attack are independent. (Take $\alpha = 0.05$) (6marks).

QUESTION THREE (20 MARKS).

(a) Mention five mathematical properties of standard deviation. (5marks).

(b) In trying to evaluate the effectiveness in its advertising campaign, a firm compiled the following information.

Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Advertising Expenditure (Sh. 000)	12	15	15	23	24	38	42	48
Sales (Million)	5.0	5.6	5.8	7.0	7.2	8.8	9.2	9.5

Determine the regression equation of sales on advertising expenditure. Estimate the probable sales when advertisement expenditure is Shs. 60,000. (10marks).

(c) Samples of two different types of bulbs were tested for length of life and the following data were obtained.

	Type I	Type II
Sample Size	8	7
Sample Mean	1234	1136
Sample Std. Dev.	36	40

Is the difference in mean life of the two types of bulbs significant? (5marks)

QUESTION FOUR (20 MARKS).

(a) Explain the following terms as used in probability. (4marks).

i) Probability space.
ii) Random experiment.
iii) Mutually exclusive events.
iv) Collective exhaustive events.

(b) The growth rates in enrolment of students at Kilifi University College for the last five years are given below.

Year	2009	2010	2011	2012	2013
Growth rate	6	50	12	16	18

Calculate the average growth rate in enrolment of the students. (3marks)

(c) Fit a straight line trend by the method of least squares to the following data.

Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Production of steel (million tons)	12	10	14	11	13	15	16

Estimate the likely production for the year 2017. (7marks)

(d) Calculate the median and mode for the distribution of the weights of 150 students from the date given below. (6marks).

Weigh (Kg)	**30 – 40**	**40 – 50**	**50 – 60**	**60 – 70**	**70 – 80**	**80 - 90**
Production of steel (million tons)	18	37	45	27	15	8