MURANGA UNIVERSITY COLLEGE

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

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DIPLOMA OF COMMERCE

COURSE CODE: BS1112

COURSE TITLE: QUANTITATIVE TECHNIQUE

DATE: 17th APRIL 2015 TIME:

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer THREE (3) questions

SECTION A:

QUESTION ONE:

a)

The probability that a salesman makes a sale on a visit to a prospect is 0.2.

What is the probability, in 2 visits, of?

a)Making no sales? (4marks)

b)Making one sale? (4 marks)

c) Making two sales? (4 marks

b) A batch of 5,000 electric lamps have a mean life of 1, ooo hours and a standard deviation of 75 hours. Assume a Normal Distribution.

a) How many lamps will fail before 900 hours? (4 marks)

b) How many lamps will fail between 950 and 1,000 hours? **(**4 marks)

c) What proportion of lamps will fail before 925 hours? (5 marks)

d) Given the same mean life, what would the standard deviation have to be to ensure that not more than 20% of lamps fail before 916 hours? (5 marks)

SECTION B:

QUESTION TWO:

a)
. A batch of weighing machines has been purchased and one machine selected at random for testing. Ten weighing tests have been conducted and the errors noted as follows:

TEST	Errors (gms)
1	4.6
2	8.2
3	2.1
4	6.3
5	5.0
6	3.6
7	1.4
8	4.1
9	7.0
10	4.5

The purchasing manager has previously accepted machines with a mean error of 3.8 gms and asserts that these tests are below standard.
Test the assertion at the 6% level. (8 marks)

b) 4. A Company makes a micro-chip in batches of 6. In a simple of 100 batches the following numbers of rejects were found:

Number of rejects Found in batch	Number of batches
0	17
1	32
2	21
3	18
4	9
5	2

6 1

100

Tests at the 5% level to see whether the frequency of rejects in a batch conforms to a Binomial Distribution. (12 marks)

Question three:

a) 1. The following data have been collected regarding sales and advertising expenditure.

Sales (€m)	**Advertising expenditure (€'000)**
8.5	210
9.2	250
7.9	290
8.6	330
9.4	370
10.1	410

Plot the above data on a scatter diagram and, using judgment, decide whether there is a correlation between sales and adverting expenditure? (7 marks)

b) Calculate **r** for the data in 1 and interpret? (13 marks)

QUESTION FOUR:

a) Analysis of representatives' car expenses shows that the expenses are dependent on the miles travelled (X_1) and the type of journey ($X_{2)}$. The general form is

$$Y = a + b_1 X_1 + b_2 x_2$$

Calculations have produced the following values (where y is expenses per month).

$$Y = €86 + 0.37x_1 + 0.08x_2$$

$$R_{x1}^2 = 0.78$$

$$R_{x1}^2 = 0.16$$

$$R^2 = 088$$

Interpret these values. (10 marks)

b) For a given operation a 10% marginal learning curve operates. Assuming that the first unit takes 30 minutes, how long should the 20^{th} unit take?

With a 10% marginal learning curve the predicted time for the 20^{th} unit can be found directly.

(10 marks)