MURANGA UNIVERSITY COLLEGE

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

MAIN/TOWN CAMPUS

ORDINARY   UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE

OF

BACHELOR OF PURCHASING AND SUPPLIES MANAGEMENT

COURSE CODE: HPS2210

COURSE TITLE: QUANTITATIVE METHODS 2

DATE: **TIME:**

INSTRUCTIONS TO CANDIDATES

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

MRUC observes ZERO tolerance to examination irregularities

QUESTION ONE   (30 MKS).

(a).   if $A = \begin{pmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} -1 & -2 & -1 \\ 6 & 12 & 6 \\ 5 & 10 & 5 \end{pmatrix}$

Find **AB**   (4mks).

(b)   The probability of a hit for an anti-tank missile is 0.7. Three missiles are fired at the tank.
    (i)   What is the probability that all missiles will hit the target?   (2mks).
    (ii)   What is the probability that no missile will hit the target?   (2mks).
    (iii)   What is the probability that at least one missile will hit the target?   (2mks).

(c)   A manufacturer of watches had determined from experience that 3% of the watches he
produces are defective. If a random sample of 300 watches is examined, what is the
probability that the proportion defective is between 0.02 and 0.035?   (8mks).

(d)   Solve the following simultaneous equations using matrix algebra.   (9mks).
$x + y + 2z = 4$
$2x - y + 3z = 9$
$3x - y - z = 2$

   (e). Mention any three components of time series.   (3mks).

QUESTION TWO (20 MKS).
(a)   In an economy there are two sectors coal and steel and the following table gives the supply
and demand position of these in millions of shillings.

	Consumer		Final demand	Total output
Products	Coal	Steel		
Coal	200	300	500	1,000
Steel	600	300	600	1,500

Determine the total output if the final demand of coal and steel is 2400 and 800   (10mks).

(b)   The following figures relate to length of service and income of the employees at an
organization.

Length of service (years)	11	7	2	5	8	5	10
Income (in tens of thousands)	7	5	3	2	6	4	8

   i.   Find the regression equation of income on years of service and examine this relationship.
                                                                                     (7mks)
   ii.   Compute the co-efficient of correlations.   (3mks).

QUESTION THREE (20 MKS).

(a)   State four properties of the co-efficient of correlation.   (4mks).

(b)   A manufacturing company produces steel pipes with daily production volumes of 500, 1000 and 2000 units respectively. According to past experience it is known that the fractions of defective output produced by the three plants are respectively at random 0.005, 0.008 and 0.010. If a pipe is selected from a day's total production and found to be defective, find out

     (i)   From which plant for this defective pipe, the probability is highest.   (11mks)

     (ii)   What is the probability that it come from the first plant?   (1mk)

(c)   If a coin is tossed 20 times and the coin falls on head after any toss. It is a success. Suppose the probability of success is 0.5. What is probability that the number of successes is less than or equal to 12?   (4mks)

QUESTION FOUR (20 MKS).

(a)   Mention four limitations of sampling   (4mks).

(b)   Two housewives, Judy and Rita asked to express their preferences for different kinds of detergents gave the following replies. (0n a scale of 1 to 10)

Detergent	Judy	Rita
A	4	4
B	2	1
C	1	2
D	3	3
E	7	8
F	6	7
G	5	6
H	5	6
I	9	9
J	10	10

To what extent the preferences of these two ladies go together?   (4mks)

(c)   A florist sells flowers in dozens and each dozen consists of two varieties namely: white Roses and Red Roses. White Roses cost Sh. 75 each whereas Red Roses cost Sh. 150 each. The selling prices for White and Red Roses are sh. 105 and sh. 175 respectively Given that the daily total cost per dozen of the Roses is shs. 1,200 and assuming that all Roses bought in a day are sold, use matrix algebra to determine;

     (i)   The number of White Roses and Red Roses that should be packed in each dozen   (6mks).

     (ii)   The daily profit earned from each dozen of flowers.   (2mks).

(d)   Explain the following terms as used in probability theory.   (4mks).
      (i)   Probability space.
      (ii)   Random experiment.
      (iii)   Mutually exclusive events.
      (iv)   Collective exhaustive events.