MURANGA UNIVERSITY COLLEGE

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

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2015/2016ACADEMIC YEAR

SECONDYEARFIRST SEMESTER EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF PURCHASING AND SUPPLIES MANAGEMENT

COURSE CODE: HPS2210

COURSE TITLE: QUANTITATIVE METHODS 2

DATE: 22nd APRIL 2016 **TIME:** 2HOURS

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is Compulsory
Answer ANY OTHER TWO (2) questions

MRUC observes ZERO tolerance to examination irregularities

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

QUESTION ONE (30mks)

(a) Mention four methods of random sampling. (4mks).

(b) A candidate is selected for interview of management for 3 companies, for the first company there are 12 candidates, for the second there are 15 candidates and for the third there are 10 candidates. What are the chances of his getting a job at least at one of the company? (5mks).

(c) If $\mathbf{A} = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$, $\mathbf{B} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ and $\mathbf{AB} = \begin{bmatrix} 6 \\ 3 \\ 1 \end{bmatrix}$

Find the values of x, y and z. (4mks).

(d) An office has 12 clerks. The long serving clerks feel that they should have a seniority increment based on length of service into their salary structure. An assessment of their efficiency by their departmental manager and the Human resource department produces a ranking of efficiency. This is shown below together with a ranking of their length of service. Do the data support the clerks, claim for seniority increment? (5mks).

Ranking according to length of service	1	2	3	4	5	6	7	8	9	10	11	12
Ranking, according to efficiency.	2	3	5	1	9	10	11	12	8	7	6	4

(e) In a quality department of manufacturing paints, at the time of dispatch of decorative paints, 30% of the containers are found to be defective. If a random sample of 500 is drawn with replacement from the population. What is the probability that the sample proportion will be less than or equal to 25% defective? 5mks).

(f) Find the inverse of the matrix. (7mks).

$$\mathbf{A} = \begin{bmatrix} 3 & 9 & 9 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$$

QUESTION TWO (20mks)

(a) Mention four properties that must be satisfied for a system to be defined as a Markow process. (4mks).

(b) In a certain town, male and female each form 50% of the population.It is known that 20% of the males and 5% of the females are unemployed. A research student studying the employment

situation selects an unemployed person at random, what is the probability that the person so selected is;

(i) Male (3mks).

(ii) Female (3mks).

(c) The following data give the ages and blood pressure of 10 women.

Age (X)	56	42	36	47	49	42	60	72	63	55
Blood Pressure (Y)	147	125	118	128	145	140	155	160	149	150

(i) Determine the regression equation of Y on X. (9mks).

(ii) Estimate the blood pressure of a woman whose age is 45 years. (1mk).

QUESTION THREE. (20mks).

(a) Explain the following terms as used in matrices.

(i) Order of a matrix. (2mks).

(ii) Square matrix. (2mks).

(b) A green grocer has a stock of fruits comprising 900 boxes of oranges. 700 boxes of grapes and 400 boxes of pears. The table below shows the market prices per box of the different types of fruits in four towns namely; Nairobi, Nakuru, Kisumu and Mombasa.

	Market Price per box (sh. "000"		
Town	Oranges	Grapes	Pears
Nairobi	4	2	3
Nakuru	5	1	2
Kisumu	4	3	2
Mombasa	3	2	5

Using matrix algebra advice the green grocer on the town in which the stock of fruits should be sold to in order to realize the maximum gross sales revenue. (6mks).

(c) Calculate the correlation co-efficient between price and sales from the following data. (10mks).

Price (sh)	100	90	85	92	90	84	88	90
Sales (sh. '000')	5	6	7	6	7	8	8	7

QUESTION FOUR (20mks

(a) Distinguish between dependent and independent events. (4mks).

(b) Nairobi Industries Company Limited operates two businesses; Industrial Products Department (IPD) and Farming Product Departments (FPD).

Analysis of the company's operations indicate that for each Ksh. 1 worth of output from IPD, 15 cents worth of inputs is required from IPD itself and 10 cents of inputs from FPD.

On the other hand each Ksh. 1 worth of output from FPD requires 5 cents and 25 cents worth of input from IPD and FPD respectively.

NIC Ltd has received an order to supply Ksh. 100million and 150million worth of industrial products and farming products respectively. Determine the total output required from each of the department to satisfy this order. (7mks).

(c) Given below are the figures of production of sugar in a factory.

Year	2004	2005	2006	2007	2008	2009	2010
Production (Million tonnes)	40	45	46	42	47	49	46

Fit a straight line trend by the method of Least Squares and estimate the value for 2014.