MURANGA UNIVERSITY COLLEGE

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

MAIN CAMPUS

SPECIAL SUPPLIMENTARY UNIVERSITY EXAMINATIONS

2015/2016 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE

OF

BACHELOR OF PURCHASING AND SUPPLIES MANAGEMENT

COURSE CODE: HPS22205

COURSE TITLE: QUANTITATIVE METHODS 1

DATE: **TIME:**

INSTRUCTIONS TO CANDIDATES

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

QUESTION ONE (30mks).

(a) Distinguish between universal set and compliment of a set. (4mks).

(b) If the cost function and revenue function of a firm that produces and sells x units of its brand are given by

C (x) = 5x + 350.

R (x) = $50 x - x^2$

(i) Find the break-even point. (3mks).

(ii) The number of units to be produced for maximum profit. (2mks).

(c) If a person repays a loan of Sh. 325,000 by paying Sh. 2,000 in the first month and then increases the payment by Sh. 1500 every month. How long will he take to clear his loan?

(d) Calculate the median and mode for the distribution of the weighs of 150 students from the data given below. (6mks).

Weight in (Kg)	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	18	37	45	27	15	8

(e) The mean monthly salary paid to all employees in a company is Sh. 16,000. The mean monthly salaries paid to skilled and unskilled employees are Sh. 18,000 and Sh. 12,000 respectively. Determine the percentage of the skilled and unskilled employees of the company. (5mks).

(f) Calculate the standard deviation and the co-efficient of variation from the following data. (6mks).

Profit (Million (sh).	No. of Companies
Less than 10	8
Less than 20	20
Less than 30	40
Less than 40	70
Less than 50	90
Less than 60	100

QUESTION TWO (20mks).

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

(b) From the date given below, calculate Fishers Ideal index numbers. (6mks)

	2010		2011	
Commodity	**Price**	**Quantity**	**Price**	**Quantity**
A	12	20	14	30
B.	14	13	20	15
C	10	12	15	20
D	6	8	4	10
E	8	5	6	5

(c) From the date below calculate the combined standard deviation.

	Group 1	**Group II**
Number	50	40
Standard Deviation	9	6
Mean	63	54

(d) Solve $x^2 - 5x + 6 = 0$ (3mks).

QUESTION THREE (20mks).

(a) Mention four mathematical properties of standard deviation. (5mks).

(b) A furniture manufacturing company plans to make two products; chair and tables. From its available resources which consist of 400 board feet of mahogany timber and 450 man -hours of labour. It knows that to make a chair requires 5 board feet and 10 man-hours and yields profit of Sh. 450, while each table uses 20 board feet and 15 man hours and has a profit of Sh. 800. Formulate a linear programming problem. (4mks).

(c) A firm produces 200 units of a product for a total of sh. 730 and 500 units for sh. 970. Assuming the cost function to be linear, derive the equation of this relationship and use it to estimate the cost of producing 400 units of the products. (4mks).

(d) Solve the simultaneous linear equations.

$5x + 6y = 28{,}000$

$4x + 8y = 30{,}000$

(e) Solve the inequality.

$3x - 2 \geq 5x + 13$ (5mks).

QUESTION FOUR (20mks)

(a) Clean wash limited conducted a market survey to investigate customers loyalty to the company's three brands of soap namely Power form, Ngarisha and Nguvu Zaidi. The following results were obtained from the survey.

- 22% were a loyal to Ngarisha brand.
- 16^% were loyal to Nguvu Zaidi brand.
- 10% were loyal to both power form and the Nguvu Zaidi.
- 7% were loyal to both Powerform and Ngarisha brands.
- 6% were loan to both Ngarisha and Nguvu Zaidi brands.
- 4% were loan to all the three types of brands

(i) Represent the above information in a vein diagram. (4mks)

(ii) Calculate the percentage of the customers that were loyal to none of the type of brand. (2mks).

(iii) Calculate the percentage of the customers that were loyal to exactly one type of brand. (2mks).

(iv) Calculate the percentage of the customers that were loyal to at least two types of brands. (2mks).