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UNIVERSITY EXAMINATIONS 2023/2024

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF PURCHASING AND LOGISTICS MANAGEMENT

SMB 3225: QUANTITATIVE METHODS I

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) Critically discuss the term quantitative methods and how these methods are applied in the business world today. (5 Marks)
- b) Explain the following types of variables.
 - i. Independent and dependent variables
 - ii. Discrete and continuous variables
 - iii. Controllable and uncontrollable variables. (6 Marks)
- c) A manufacturer makes two products Q and R. the cost of making 15 units of product Q and 10 units of product R is sh. 6000. The cost making 5 units of product Q and 8 units of product R is sh.3400. the manufacturer makes a profit of 20% and 25% on each unit of product Q and product R respectively.

Required:

- i. Express the above cost of making one unit of products Q and R in form of simultaneous equation. (2 Marks)
- ii. Calculate cost of making one unit of product Q and product R. (4 Marks)
- iii. Calculate the selling of one unit of product Q and product R. (4 Marks)



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ISO/IEC 27001:2013 CERTIFIED

QUESTION TWO (20 MARKS)

a) An intelligence test was undertaken by ten sales ladies of a certain company.

The table below shows the intelligence test score in percentages and the mean weekly sales in thousands of shillings made by the sales ladies

Sales lady	Intelligence test score (%)	Weekly sales (sh.000)
1	40	50
2	70	120
3	50	80
4	60	100
5	80	80
6	50	50
7	90	110
8	40	60
9	60	90
10	60	60

Required:

The coefficient of correlation and interpret. (8 Marks)

b) Explain the difference between correlation and regression analysis. (4 Marks)

c) A group of eight students were tested in Quantitative Methods and Auditing examination.

The marks scored were as follows

Students.	QM	Auditing
A	76	82
B	43	57
C	49	75
D	84	86
E	69	68
F	69	92



G	53	43
H	36	53

Required.

Compute the spearman's rank correlation coefficient and interpret. (8 Marks)

QUESTION THREE (20 MARKS)

- a) Discuss the following terms as used in Quantitative methods.
- i. Quantitative variables (3 Marks)
 - ii. Survey planning (3 Marks)
 - iii. Sampling (3 Marks)
- b) Consider the data which represents masses to the nearest kilograms of fish caught in Lake Naivasha in a day.

Mass kg	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
No. of fish	6	20	12	10	5	6	2	1

- i. Determine the mean weight. Use indirect method. (5 Marks)
- ii. What is the coefficient of variation. (6 Marks)

QUESTION FOUR (20 MARKS)

- a) Solve the equation
- i. $x_1 + 2x_2 + x_3 = 3$
 - ii. $2x_1 + 3x_2 + 2x_3 = 1$
 - iii. $-3x_1 + 4x_2 + x_3 = -2$ (5 Marks)
- b) Calculate $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for the following functions.
- i. $y = 5x^2 - 2x + 4$ (2 Marks)
 - ii. $y = 12 - 10x + 6x^2 - 2x^3$ (3 Marks)
- c) A firm's demand function is given by:
 $p = 100 - 2x$ and its cost function $c(x) = 20x + 3000$ where p is the price per unit c is the cost per unit.



Required:

- i. Find the function for total Revenue. (2 Marks)
- ii. Function for total cost (2 Marks)
- iii. Determine the optimum level of output for profit maximization. (6 Marks)

QUESTION FIVE (20 MARKS)

- a) Discuss index numbers and their uses in any economy. (5 Marks)
- b) What are the main uses of regression analysis: (5 Marks)
- c) The following data shows the tests scores made by sales ladies on an intelligence test and their weekly sales.

Sales lady.	Test score	Sales (sh.000)
A	40	25
B	70	50
C	60	40
D	70	50
E	80	40
F	50	25
G	90	55
H	40	30
I	60	45
J	70	30

Required:

Calculate the regression line of sales on test scores and estimate the probable weekly sales volume if a salesman makes a score of 100. (10 Marks)

