(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

FIRST YEAR second SEMESTER

Main EXAMINATION

FOR THE DEGREE OF BED(arts)

COURSE CODE: KUC 125

COURSE TITLE: QUANTITATIVE SKILLS

DATE: 6/09/2022   **TIME:** 0900Hrs – 1100Hrs

INSTRUCTIONS TO CANDIDATES

Answer Question One and any other TWO Questions

TIME: 2 Hours

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

QUESTION ONE

    i.   Differentiate between taxable income and gross income   (2marks)

    ii.   List any **two** uses of matrices   (2 marks)

    iii.   Highlight any **four** monetary measures used to curb inflation   (4marks)

    iv.   List and explain any **four** types of taxes that are used to get revenue for government expenditure   (8marks)

    v.   Discuss any **four** principles of public expenditure   (8 marks)

    vi.   Determine the inverse T^{-1} of the matrix

$$\begin{pmatrix} 1 & 2 \\ 1 & -1 \end{pmatrix}$$

Hence find the coordinates to the point at which the two lines

$x + 2y = 7$ and $x - y = 1$ intersect   (4marks)

    vii.   Compute the geometric mean of 1,2,3,4,5   (2marks)

QUESTION TWO

a) Given that $A = \begin{pmatrix} 0 & -1 \\ 3 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} -1 & 0 \\ 2 & -4 \end{pmatrix}$

I   Find the value of x if

    (i) $A - 2x = 2B$ (3 marks)

    (ii) $3x - 2A = 3B$ (3 marks)

    (iii) $2A - 3B = 2x$ (3 marks)

II   The transpose of A   (2 marks)

    b)   Use Crammer's rule to solve

        $2x+y+z=4$

        $x-y-2z=0$

        $5x-2y-4z=3$ (9 marks)

QUESTION THREE

The following data was obtained from the heights in centimeters of students.

168,142,171,153,155,173,164,148,159,161,172,149,171,168,155,173,164,149,161,142,148,

164,159,164,173,164,152,153,164,155,148,164.

    a) Prepare a grouped frequency distribution table for this data using class size 5 starting
       with the class 142-146   (3 marks)
    b) Use the data to draw a graph of cumulative frequency and use it to estimate the median of
       the distribution.   (7 marks)
    c) Use the data to calculate
       i)   The mean   (3 marks)
       ii)   The median   (3 marks)
       iii)   The standard deviation   (4 marks)

QUESTION FOUR

    a) State and explain **four** categories of activities that your home county government spends
       its revenue on.   (8 marks)
    b) The table below shows quantity and price of some cereals produced in 2020 and 2021.

Items	2020		2021	
	Price(ksh)@ kg	Quantity(kgs)	Price(ksh)@kg	Quantity(kgs)
M	70	700	50	490
B	50	270	70	280
C	100	350	90	290
W	90	500	40	420
M	30	160	100	250

Using 2020 as the base year, calculate and interpret
       i.   Laspeyre's index   (3 marks)
       ii.   Paache's index   (3 marks)
       iii.   Fisher's ideal index   (3 marks)
       iv.   Marshall-edge worth index   (3 marks)

QUESTION FIVE

a) Explain any **five** shortfalls in the tax system   (10 marks)

b) The following table shows income tax rates for a certain year.

Monthly income in kshs	% tax rate per shilling
1 – 9400	10
9401 – 18000	15
18001 – 26600	20
26601 – 35600	25
35601 and above	30

A monthly tax relief of shs.1172 was allowed. Onex's taxable income in the last band was kshs.3200 in a month.

    I. Calculate;

      i. His taxable income   (2 marks)

      ii. The amount of tax he paid in a month   (5 marks)

    II. Onex's salary included a medical allowance of shs.6000 and a commuter allowance of shs.8000. He contributed 6% of his basic salary to a cooperative for shares. Calculate his monthly net salary.   (3 marks)