



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
FIRST YEAR FIRST SEMESTER**

**SCHOOL OF ARTS, HUMANITIES SOCIAL
SCIENCES AND CREATIVE INDUSTRIES
DIPLOMA IN CRIMINOLOGY**

COURSE CODE: DSS 1101

COURSE TITLE: QUANTITATIVE SKILLS

DATE:

TIME:

INSTRUCTIONS

- Answer question ONE and any other TWO questions from section II
- Question one is compulsory

SECTION A

Question one

a). solve the following simultaneous equation

$$x + y = 7$$

$$3x + y = 15 \quad (3\text{mks})$$

b) Solve the following equation (2mks)

c) Find the value of k that will make the following a perfect square (2mks)

d) What is the meaning of the following terms (7mks)

- Set
- Element
- Union of a set
- Complement of a set
- Finite set
- Infinite set
- Singleton set

e) Given the following sets, $A = \{1,2,3,4\}$, $B = \{2,3,4,5,6\}$ and $C = \{4,6,8,9\}$. Find (6mks)

- $A \cap B$
- $A \cup C$
- The difference between A and B

f) given that $U = \{1,2,3,4,5,6,7,8,9,10\}$ and $A = \{4,8,9,10\}$ find (3mks)

g) A boy borrows Sh. 1000 from his sister and promises to pay back Sh. 1,200 a Three months later. What is this as an annual rate of interest? (3mks)

h) Define the following terms as used in statistics (3mks)

- Quantitative variable
- Tabulation
- Categorical frequency distribution

SECTION B

Question two

The data below shows the marks scored by students in a mathematics class. Complete the table (2mks)

Class	30 – 44	45 - 54	55 - 64	65 - 74	75 – 84	85 - 94
Frequency	10	16	18	12	8	10
Cumulative frequency						

Use the table above to calculate

- Mean (4mks)
- Median(4mks)
- Mode(4mks)
- Variance and standard deviation (6mks)

Question three

a) The 20th term of an arithmetic sequence is 60 and the 16th term is 20. Find

- The first term (3mks)
- The common difference (2mks)
- The 10th term of the sequence (2mks)

- The sum of the first 50 terms of the arithmetic sequence
(3mks)

b. The n^{th} term of a G.P is given by $3 \cdot 2^{n-1}$. Determine

- The first five terms (2mks)
- The sum of the first 6 terms of the sequence
(3mks)
- Find the sum of the first 10 terms of the sequence (3mks)
- The greatest value of n for which the sum $S_n \leq 3069$ (2mks)

Question four

a) A company invested Sh. 50000 in a bank that pays a compound interest of 10% p.a. Calculate;

- The amount after 4 years. (3mks)
- The interest accumulated after 3 years (2mks)

b) Find the simple interest earned on sh.2000 at 10% per annum for

- 4 years (3mks)
- The amount after 5years (2mks)

c) The table below shows tax rates for the year 2021

Taxable monthly income (Ksh)	Tax rates (%)
1 – 9860	10
9861 – 18800	15
18801 – 27920	20
27921 – 37040	25
37041 – And above	30

Jane's monthly earnings were as follows:

Basic salary =sh.20000

House allowances =Ksh.10000

Medical allowances =sh.3000

Commuter allowances = sh.4000

If Jane is entitled to a tax relief of 900, calculate the net income
(10mks)

Question five

a) Find the value of x in the equation (3mks)

$$\frac{3x+2}{7} - \frac{2x+5}{-4} = -7$$

b) Solve the simultaneous equation below using elimination method(4mks)

$$2x + 5y = 12$$

$$3x + 3y = 9$$

c) Solve the following simultaneous equations using substitution method(4mks)

$$3x + 4y = 18$$

$$5x + 2y = 16$$

d) Check if the equation below is a perfect square(3mks)

$$7x^2 + 28x + 28$$

e) Which value of k makes the quadratic equation below a perfect square(2mks)

$$kx^2 - 4x - 16$$

f) Solve the quadratic equation below using completing the square method(4mks)

$$x^2 - 4x - 12 = 0$$

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