



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR
FIRST YEAR FIRST SEMESTER**

**SCHOOL OF PURE, APPLIED AND HEALTH
SCIENCES
DIPLOMA IN SOCIAL WORK**

**COURSE CODE: DSS 1101
COURSE TITLE: QUANTITATIVE SKILLS**

DATE: 5TH DECEMBER, 2022

TIME: 0830-1030

INSTRUCTIONS

1. Answer question ONE and any other TWO questions from section II
2. Question one is compulsory

SECTION A

Question one

a). The cost of 5 shirt and 3 blouses is sh. 1750. Jane bought 3 shirts and one blouse for sh.850. Find the cost of each shirt and each blouse (4mks).

b) A man is 24 years older than his son. After 10 years he will be three times as old as his son. How old is the son? (3mks)

c) The first term of an A.P is 2 and the common difference is 5.

List the first three terms of the sequence (3mk)

d) What is the meaning of the following terms (5mks)

- i. Set
- ii. Element
- iii. Finite set
- iv. Infinite set
- v. Singleton set

e) Given the following sets, $A = \{1,2,3,5,8,9\}$, $B = \{6,7,10,11\}$ and $C = \{4,6,7,9,10\}$. Find (6mks)

- i. $A \cap B$
- ii. $A \cup C$
- iii. The difference between A and B

f) Given that $U = \{a, b, c, d, e, f, g, h\}$ and $A = \{c, d, e, f\}$ find A^c (3mks)

g) Jane deposited sh. 2000 in a bank that pays simple interest at 12% p.a. Calculate the amount in the bank at the end of 3 years. (3mks)

h) Evaluate $\frac{8!}{2!6!}$ (3mks)

SECTION B

Question two

a. The data below illustrate the distribution of wages of employees in a certain company. Use it to answer the following questions.

Wages	20-29	30-39	40-49	50-59	60-69	70-79
frequency	2	5	10	12	8	3

- a. Calculate
 - i. Arithmetic mean (4mks)
 - ii. Mode (4mks)

- iii. Median (4mks)
- iv. Variance (4mks)
- v. Standard deviation (2mks)

Question three

a) The n^{th} term of a sequence is given by $2n+3$

- i. Write down the first four terms of the sequence (2mks)
- ii. Find S_{50} , the sum of the first 50 terms of the sequence (3mks)
- iii. Show that the sum of the first n terms of the sequence is given by $S_n = n^2 + 4n$ (2mks)
- iv. Find the 10th term of the arithmetic sequence (3mks)

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

- i. The first four terms (2mks)
- ii. The 6th term of the sequence (3mks)
- iii. Find the sum of the first 5 terms of the sequence (3mks)
- iv. Find the sum of the first 5 terms of the sequence (2mks)

Question four

a) A company invested Sh. 1500 in a bank that pays a compound interest of 12% p.a. Calculate;

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

b) Find the simple interest earned on sh.10000 at 10% per annum for

- i. 3 years (3mks)
- ii. The amount after 3years (2mks)

C. The table below shows tax rates for the year 2022

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.40000

House allowances =Ksh.10000

Medical allowances =sh.4000

Commuter allowances = sh.6000

If Jane is entitled to a tax relief of 1160, 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 following equation using substitution method (10mks)

$$3x+5y+6z=34$$

$$9x+8y+4z=46$$

$$6x+4y+4z=32$$

c) Find the value of k that makes the following perfect square

$$x^2 + k + 36 \quad (3mks)$$

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

$$4x^2 - 14x - 8 = 0$$

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