



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR
FIRST YEAR FIRST SEMESTER**

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

COURSE CODE: DSS1101

COURSE TITLE: QUANTITATIVE SKILLS I

DATE: 1/2/2024

TIME: 1100-1300 HRS

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) How many elements are in each of the sets below (6mks)

- i. $A = \{1, 2, 3, 10, 12, 15\}$
- ii. $C = \{a, d, e, g, k, q\}$
- iii. $M = \{1, 2, 3, 4\}$

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 (7mks)

- i. Set
- ii. Element
- iii. Finite set
- iv. Infinite set
- v. Singleton set
- vi. Union of a set
- vii. Complement of a 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 $A = \{a, b, d\}$ 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 4 years. (3mks)

h) Evaluate $\frac{4!}{2!3!}$ (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 10^{th} term of the arithmetic sequence (3mks)

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

- i. The first four terms (2mks)
- ii. The 6^{th} 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 6 terms of the sequence (2mks)

Question four

a) Jane invests Sh. 25,000 in a building society account that pays a simple interest of 10% p.a. calculate; (12mks)

- i. The interest accumulated after 4 years
- ii. The interest accumulated after 8 years
- iii. The total amount after 10 years
- iv. How long it will take to accumulate a total of Sh. 75,000.

b) A company invested Sh. 450,000 in a bank that pays a compound interest of 20% p.a. Calculate; (8mks)

- i. The amount after 5 years.
- ii. The amount after 6 years

Question five

a) Use substitution method to solve simultaneous equations below (8mks)

1.
$$\begin{aligned} 3x + 4y &= 18 \\ 5x + 2y &= 16 \end{aligned}$$

2.
$$\begin{aligned} 2x - 3y &= 23 \\ 7x + 4y &= 8 \end{aligned}$$

b) Factorise and solve the following equations (6mks)

1. $x^2 - 5x - 6 = 0$

2. $x^2 - 2x - 35 = 0$

c) Solve by completing the square method (4mks)

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

d) Find the value of k that make the equation below a perfect square (2mks)

$$x^2 + kx + 4$$

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