MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER

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

COURE CODE: DSS 1101

COURSE TITLE: QUANTITATIVE SKILLS

DATE: 25/4/2023 **TIME: 1430-1630**

INSTRUCTIONS

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

SECTION A

Question one

a). The total number of pupils who play tennis and volleyball in a class is 14. If there are six more pupils playing volleyball than tennis, find the number of pupils in each team, given that no pupil plays more than one game (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) If A is a set of odd numbers less than 10 and B is a set of prime numbers less than 10, Write down members of the set A and B and hence find A-B. (5mks)

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= {1,2,3,5,7,8}, B= {6,7,8,10,11} and C= {4,5,6,7,9,10}. Find (4mks)

i. A U B
ii. A ∩ C

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

g) Jane deposited sh. 25000 in a bank that pays simple interest at 10% p.a. How long will it take to accumulate a total of sh. 50000? (3mks)

h) Evaluate $\frac{7!}{2!\,5!}$ (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	10-19	20-29	30-39	40-49	50-59	60-69
frequency	5	3	10	12	6	2

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+4

i. Write down the first four terms of the sequence (2mks)
ii. Find S_{30}, the sum of the first 30 terms of the sequence (3mks)
iii. Show that the sum of the first n terms of the sequence is given by $S_n = n^2 + 5n$ (2mks)
iv. Find the 20^{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 greatest value of n for which the sum $S_n<3069$ (2mks)

Question four

a) A company invested Sh. 2000 in a bank that pays a compound interest of 10% p.a. Calculate;

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

b) Find the simple interest earned on sh.20000 at 10% per annum for

i. 5 years (3mks)
ii. The amount after 5years (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.30000

House allowances =Ksh.20000

Medical allowances =sh.4000

Commuter allowances = sh.5000

If Jane is entitled to a tax relief of 1000, calculate the net income (10mks)

Question five

a) What is the meaning of the following terms (3mks)

i. Variable

ii. Qualitative variables

iii. Quantitative variables

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

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

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

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

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