MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2020/2021 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER

SCHOOL OF ARTS, HUMANITIES, SOCIAL SCIENCES AND CREATIVE INDUSTRIES

DIPLOMA IN SOCIAL WORK

COURSE CODE: CRM101

COURSE TITLE: QUANTITATIVE SKILLS

DATE: TIME:

INSTRUCTIONS

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

SECTION A

Question one

a). solve the following simultaneous equation(3mks)

x + y =7

3x+y =15

b) Solve the following equation (2mks)

$x^2 - 3x + 2 = 0$

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

$x^2 + kx + 16$

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

i. Set
ii. Element
iii. Union of a set
iv. Complement of a set
v. Finite set
vi. Infinite set
vii. 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)

i. A∩B
ii. A U C
iii. 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 A^C (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)

i. Quantitative variable
ii. Tabulation
iii. 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

a. Mean (4mks)
b. Median(4mks)
c. Mode(4mks)
d. Variance and standard deviation (6mks)

Question three

a) The 20^{th} term of an arithmetic sequence is 60 and the 16^{th} term is 20. Fnd

i. The first term (3mks)
ii. The common difference (2mks)
iii. The 10^{th} term of the sequence (2mks)
iv. The sum of the first 50 terms of the arithmetic sequence (3mks)

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

i. The first five terms (2mks)
ii. The sum of the first 6 terms of the sequence (3mks)
iii. Find the sum of the first 10 terms of the sequence (3mks)
iv. The greatest value of n for which the sum $S_n < 3069$ (2mks)

Question four

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

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

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

i. 4 years (3mks)
ii. 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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