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 CRIMINOLOGY

COURSE CODE: CRM101

COURSE TITLE: QUANTITATIVE SKILLS

DATE: 28/5/2024   **TIME: 1430-1630 HRS**

INSTRUCTIONS

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

SECTION A
Question one

a). Consider the following data set

2,3,4,2,4,7,2,3,4,9,4
  i.   Calculate
        a. The mean (3mks).
        b. The mode (1mks).
        c. Median (1mks).
b) How many elements are in each of the sets below (6mks)
  ii.   A= {1,2,3,10,}
  iii. C= {a, d, k, q}
  iv.   M= {1, 2, 3, 4,5,6,7,9,10,14}
c) What is the meaning of the following terms (8mks)
  i.   Set
  ii.   Element
  iii. Finite set
  iv.   Infinite set
  v.   Singleton set
  vi.   Union of a set
  vii. Complement of a set
  viii. Frequency
d) 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∩B
  ii.   A U C
  iii. The difference between A and B
e) Given that U= {a, b, c, d, e, f, g, h} and A= {a, b, d} find A^C (3mks)
f) Jane deposited sh. 5000 in a bank that pays simple interest at 10% p.a. Calculate the amount in the bank at the end of 5 years. (4mks)

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	50-56	57-63	64-70	71-77	78-84	85-91

Frequency	8	3	12	10	5	2

a. Calculate
  i. Arithmetic mean (4mks)
  ii. Mode (4mks)
  iii. Median (4mks)
  iv. Variance (4mks)
  v. Standard deviation (2mks)

Question three

a) The nth term of a sequence is given by $2n+3$
  i. Write down the first five terms of the sequence (3mks)
  ii. Find S_{10}, the sum of the first 10 terms of the sequence (4mks)
  iii. Find the 10th term of the arithmetic sequence (3mks)

b. The nth term of a G.P is given by $2 \times 2^{n-1}$.
  i. The first four terms (2mks)
  ii. The 10th term of the sequence (3mks)
  iii. Find the sum of the first 6 terms of the sequence (3mks)
  iv. The 6th term of the sequence (2mks)

Question four

a) Jane invests Sh. 10,000 in a building society account that pays a simple interest of 10% p.a. calculate; (12mks)
  i. The interest accumulated after 5 years
  ii. The interest accumulated after 10 years
  iii. The total amount after 5 years
  iv. How long it will take to accumulate a total of Sh. 30,000.

b) A company invested Sh. 50,000 in a bank that pays a compound interest of 10% p.a. Calculate; (8mks)
  i. The amount after 4 years.
  ii. The interest after 4 years

Question five

a) Solve simultaneous equations below (8mks)

1. $3x + 4y = 18$
   $5x + 2y = 16$

2. $x + y = 7$
   $3x + y = 15$

b) Factorise and solve the following equations (6mks)
   i. $2x^2 + x - 6 = 0$
   ii. $x^2 - 8x - 9 = 0$

c) Solve by completing the square method (4mks)
   $x^2 - 5x - 6 = 0$

d) Find the value of k that make the equation below a perfect square (2mks)
   $x^2 + kx + 16$

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