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: CRM 101

COURSE TITLE: QUANTITATIVE SKILLS I

DATE: 29/1/2024 **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) Solve the simultaneous equations below (6mks)

1. $2x + 5y = 12$
   $3x + 3y = 9$

2. $10x - 18y = -1$
   $8x + 9y = 7$

b) Solve the following equation (3mks)

$x^2 + 5x + 6 = 0$

c) Find the value of k that will make the following a perfect square (3mks)

$2x^2 + kx + 200$

d) Define the following terms(3mks)

i. A set
ii. A finite set
iii. An infinite set

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

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

f) Find A U B given that; A={1,2,3,4}, B={3,2,5,0} (2mks)

g) What is the meaning of qualitative and quantitative variables and give an example in each case (4mks)

h) Calculate the mean, median and mode for the following data set (3mks).

23, 21, 23, 23, 21, 25, 23, 24, 22, 23, 26, 23

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	18	20	12	8	6
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) Use substitution method to solve simultaneous equations below (8mks)

1. $3x + 4y = 18$
   $5x + 2y = 16$
2. $2x - 3y = 23$
   $7x + 4y = 8$

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

$$x^2 + kx + 4$$

Question four

a) Natasha 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 Company manufactures products alpha, beta and gamma. Alpha takes 10 hours, 20 hours and 9 hours in Departments A, B and C respectively. Beta takes 12 hours, 21 hours and 10 hours in Departments A, B and C respectively. Gamma takes 16 hours, 26 hours and 10 hours in Departments A, B and C respectively. The total hours available for Departments A, B and C are 122, 220 and 95 respectively. Determine the number of each product that must be produced in order to exhaust all the time. (20 marks)

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