



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2018/2019 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER

**SCHOOL OF ARTS AND SOCIAL SCIENCES
DIPLOMA IN SOCIAL WORK**

COURSE CODE: DAS 101

COURSE TITLE: QUANTITATIVE SKILLS

DATE: 29TH APRIL, 2019

TIME: 1430 – 1630HRS

INSTRUCTIONS TO CANDIDATES

1. Answer Question **ONE** and any other **THREE** questions
2. Do not forget to write your Registration Number

This paper consists of 5 printed pages. Please turn over.

Question One

Evaluate and simplify the following fractions.

a) $\frac{a^2b}{ab^2}$ (2 Marks)

b) $\frac{(2t-1)^5}{(2t-1)^3}$ (2 Marks)

c) $\frac{x^2+4x}{x^2-16}$ (2 Marks)

d) $\frac{(y-5)}{(y+1)} \times \frac{(y+1)}{(y+2)}$ (2 Marks)

e) Using the formula for the area of a circle, change the subject of the formula to 'r'.

$$A = \pi r^2 \quad (3 \text{ Marks})$$

f) Sketch scatter graphs showing the following

i) Perfect positive correlation (2 Marks)

ii) Perfect negative correlation (2 Marks)

iii) No correlation (2 Marks)

g) Use the table below to answer the following questions:

| | | | | | | | | | |
|---|----|----|----|----|----|----|----|----|----|
| X | 15 | 24 | 25 | 30 | 40 | 45 | 65 | 70 | 75 |
| Y | 60 | 45 | 50 | 35 | 46 | 28 | 20 | 22 | 15 |

i) Determine the product moment coefficient of correlation

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \times \sqrt{n \sum y^2 - (\sum y)^2}}$$

(4 Marks)

- ii) Determine the regression equation and estimate y when $x = 20$

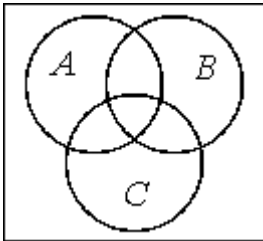
NB: Use the equations below to get the trend line

$$\begin{aligned}\Sigma y &= an + b\Sigma x \\ \Sigma xy &= a\Sigma x + b\Sigma x^2\end{aligned}$$

(4 Marks)

Question Two

- a) Differentiate between finite and infinite sets and give an example of each **(4 Marks)**
- b) What is a Venn diagram? What is it used for? **(4 Marks)**
- c) Given the Venn diagram below shade $B \cup C$ **(2 Marks)**



- d) At a breakfast buffet, 20 people chose coffee and 17 chose juice. 10 people chose both coffee and juice. If each person chose at least one of these beverages, how many people visited the buffet? **(5 Marks)**

Question Three

- a) State the principal components of a time series and give a brief explanation of each **(8 Marks)**

b) The sales data of Marian Ltd. (in millions of shillings) for the years 2001 to 2004 inclusive are as given below:

| Year | Quarter | | | |
|------|---------|----|-----|-----|
| | 1 | 2 | 3 | 4 |
| 2001 | 40 | 64 | 124 | 58 |
| 2002 | 42 | 84 | 150 | 62 |
| 2003 | 46 | 78 | 154 | 96 |
| 2004 | 54 | 78 | 184 | 106 |

Required:

- (i) The trend in the data using the least squares method. **(3 marks)**
- (ii) The estimated sales of each quarter of year 2004. **(4 marks)**

Question Four

a) Distinguish between a logarithmic and exponential functions. **(3 Marks)**

b) Convert the following exponential form to logarithmic form.

i) $2^5 = 32$ **(2 Marks)**

ii) $9^x = 88$ **(2 Marks)**

iii) $6^7 = 3x$ **(2 Marks)**

c) Convert the following logarithmic form to exponential form.

i) $\log_8 73 = x$ **(2 Marks)**

ii) $\log_x 54 = 9$ **(2 Marks)**

iii) $x = \log_4 91$ **(2 Marks)**

Question Five

a) Define the terms Mean, Mode and Median **(3 Marks)**

b) Calculate variance from the following distribution of marks:

| Marks | No. of Students |
|-------|-----------------|
| 1-3 | 40 |
| 3-5 | 30 |
| 5-7 | 20 |
| 7-9 | 10 |

(4 Marks)

c) A student has gotten the following grades on his tests: 87, 95, 76, and 88. He wants an 85 or better overall. What is the minimum grade he must get on the last test in order to achieve that average?

(5 Marks)

d) Find the median for the following list of values. 8, 9, 10, 10, 10, 11, 11, 11, 12, 13

(3 Marks)

//END