



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2022/2023

FIRST YEAR FIRST SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE
DEGREE OF BACHELOR OF SCIENCE HORTICULTURE

FIRST YEAR FIRST SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE
DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE EDUCATION DEVELOPMENT

SMF 3111: MATHEMATICS 1

DATE: AUGUST 2023

TIME: 2 HOURS

INSTRUCTIONS: Answer question one and any other two questions

QUESTION ONE (30 MARKS)

- a) Differentiate between following terms;
- (i) Sample space and event (2 marks)
 - (ii) Primary and Secondary data sources (2 marks)
- b) For how long must a sum be deposited in an account paying 14% compound interest in order for the value to double (5 marks)
- c) Find the sum and product of the following matrices A and B (4 marks)

$$A = \begin{pmatrix} 2 & 4 \\ 3 & 2 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 3 \\ 2 & 6 \end{pmatrix}$$

- d) Find the 7th term of the GP 2, -6, 18 ----- (3 marks)
- e) Compute mean and standard deviation for the following data (6 marks)

x	4	6	8	10	12
f	2	9	13	7	1



- f) Rationalize and simplify (3 marks)

$$\frac{\sqrt{2} + 2\sqrt{5}}{\sqrt{5} - \sqrt{2}}$$

- g) Expand and simplify $\left(1 + \frac{1}{2}x\right)^5$ up to the fourth term and hence evaluate $(1.05)^5$ (5 marks)

QUESTION TWO (20 MARKS)

- a) The data below shows the number of tractors sold in outlets within three months in country X.

No. of Outlets	11-19	20-28	29-37	38-46	47-55
No. of tractors	2	4	9	4	1

- (i) Compute the mean (3 marks)
(ii) What is the median? (3 marks)
(iii) Compute the interquartile range (7 marks)
(iv) What is the standard deviation? (4 marks)
(v) Use a histogram to represent the data (3 marks)

QUESTION THREE (20 MARKS)

- a) Use the method of completing square to solve for x for (5 marks)
 $x^2 + 7x - 3 = 0$
- b) Solve for x in the equation $3^x \cdot 7^{2x+1} = 37$ correct to 3 decimal places (7 marks)
- c) The fourth term of an AP is 13 while the seventh term is 22. Determine
- (i) The first term and common difference (4 marks)
(ii) The value of n of the nth term is 100 (4 marks)

QUESTION FOUR (20 MARKS)

- a) Factorize the expression $6x^3 - 17x^2 - 4x + 3$ and hence solve for the cubic equation
 $6x^3 - 17x^2 - 4x + 3 = 0$ given that $x - 3$ is a factor (7 marks)
- b) List three rules of probability (3 marks)



- c) For two events A and B, $P(\sim A) = \frac{3}{10}$ and $P(B) = \frac{13}{20}$ if $P(A \cap B) = \frac{9}{20}$ find;
- (i) $P(A \cup B)$ (4 marks)
 - (ii) $P(\sim A \cap B)$ (3 marks)
 - (iii) $P(A \cup \sim B)$ (3 marks)

QUESTION FIVE (20 MARKS)

- a) In a triangle ABC, AB=42CM, BC = 37cm and AC = 26cm. find the missing angles and sides. (8 marks)
- b) Find the area of a triangle with B = 21° , C = 46° and AB = 9cm (3 marks)
- c) Solve the equation (6 marks)
 $4^x - 15(2^x) + 56 = 0$
- d) An amount of 72900 is gotten at the end of 2 years at 8% annual compound interest. Find the principal (3 marks)

