



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS
SPECIAL EXAMINATION
FIRST YEAR EXAMINATION FOR THE AWARD OF
DEGREE IN BACHELOR OF SCIENCE
SECOND SEMESTER 2021/2022
(JULY, 2022)

MATH 100: GENERAL MATHEMATICS

STREAM: Y1 S2

TIME: 2 HOURS

DAY: TUESDAY, 8.00 AM – 10.00 AM

DATE: 26/07/2022

INSTRUCTIONS:

- 1. Do not write anything on this question paper.**
- 2. Answer Question ONE (Compulsory) and any other TWO Questions.**

QUESTION ONE

- a. Define the following terms as used in mathematics
 - i. Natural numbers (2 marks)
 - ii. Whole numbers (2 marks)
 - iii. Integers (2 marks)
 - iv. Complex numbers (2 marks)
 - v. Rational numbers (2 marks)
- b. Solve for x , $2x - 24 + x^2 = 0$ using:-
 - i. Factorization method (4 marks)
 - ii. Formula method (4 marks)
- c. Solve for m in the equation $4(m - 2) - 3(m - 1) = 2(m + 6)$ (4 marks)
- d. Expand $(1 + x)^7$ up to the term x^3 and use it to estimate $(0.98)^7$ correct to 3 decimal points. (4 marks)
- e. Find $\tan 135^\circ$ without using a calculator (4 marks)

QUESTION TWO

- a. State and in each case give an example of any five properties of real numbers. (10 marks)
- b. Solve the system of linear equation below using
- i. Elimination method (5 marks)
 - ii. Substitution method (5 marks)
- $$\frac{1}{2}x + \frac{2}{3}y = 4 \dots\dots\dots (i)$$
- $$-\frac{3}{2}y + \frac{1}{4}x = 20 \dots\dots\dots (ii)$$

QUESTION THREE

- a. The first, third and seventh terms of an increasing A.P are three consecutive terms of a G.P. If the first term of A.P is ten. Find the common difference of A.P. (8marks)
- b. A baker makes two types of cakes A and B. Type A requires 40 grams fat and 320 grams of flour. Type B requires 50 grams of fat and 300 grams of flour. The baker has only 1 kg of fat and 4.8 kg of flour. Write down four inequalities that which can be used to represent this situations. (12marks)

QUESTION FOUR

- a. Find the following without using calculators
- i. $\sin 75^\circ$ (3 marks)
 - ii. $\cos 105^\circ$ (3 marks)
 - iii. $\sin 135^\circ$ (3 marks)
 - iv. $\cos 75^\circ + \tan 75^\circ$ (3 marks)
- b. Expand $(2 + 3i)(2 - 3i)$ (4 marks)
- c. A geometric sequence is 25. If the term of the sequence is six. Find the 10th term. (4 marks)

QUESTION FIVE

- a. Solve for t in the equation $7t + t^2 = 120$ (4 marks)
- b. Expand $(1 + x)^3$ and hence use it to evaluate $(1.03)^3$ (4 marks)
- c. Show that $\cos^4\theta - \sin^4\theta = \cos^2\theta - \sin^2\theta$ (6 marks)
- d. Given that $2n, 3n$ and $4n+2$ are consecutive terms of a G.P. determine;-
- i. The common ratio (3 marks)
 - ii. The value of n (3 marks)