

041

**TANZANIA HEADS OF ISLAMIC SCHOOLS COUNCIL
FORM FOUR INTER ISLAMIC MOCK EXAMINATION**

BASIC MATHEMATICS

(For both School and Private Candidates)

TIME: 3 HOURS

Tuesday, 19th August 2025 a.m.

Instructions

1. This paper consists of **two (2)** sections, A and B.
2. Answer **all** questions from sections A and B.
3. All necessary workings and answers for each question must be shown clearly.
4. NECTA mathematical table, and non-programmable calculators may be used.
5. All writings should be in blue or black ink, while drawings should be in pencil.
6. All communication devices and any unauthorized materials are **not** allowed in the examination room.
7. Write your **Examination Number** on every page of your answer booklet(s) provided.

SECTION A (60 Marks)
Answer **all** questions in this section

1. (a) A shopkeeper measured a mass of $0.\overline{3}\overline{6}$ kg of sugar. Express the mass in terms of:
 - (i) Fraction
 - (ii) Percentage

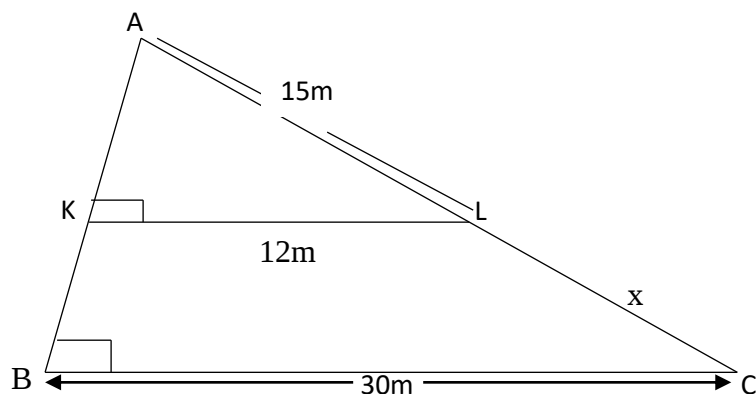
- (b) Express 0.03785 correct to:
 - (i) 3 significant figures
 - (ii) 3 decimal places
 - (iii) Standard notation

2. (a) Given that $V = \sqrt{\frac{3u(u-a)}{2}}$. Make “a” the subject of the formula.
- (b) Express $\frac{\sqrt{3}}{2-\sqrt{3}}$ in the form of $a + b\sqrt{c}$ where a, b, and c are integers.
- (c) Given that, $\log_{10} x = \overline{1.413}$, find the value of $\log_{10} \sqrt{x}$.

3. (a) In a class of 30 students, 15 liked Mathematics, 18 liked English, and 4 liked neither Mathematics nor English. Use the formula to find the number of students who like both Mathematics and English.
- (b) A card is selected at random from a pack of playing cards. Find the probability that the card is an ace or a black card.

4. (a) Point P lies on the x-axis and is equidistant from point R(8,4) and Q(6,6). Find the coordinate of P.
- (b) Given $\underline{a} = (4, -3)$ and $\underline{b} = (-2, 1)$; find the unit vector in the direction of $3\underline{a} - 2\underline{b}$.

5. (a) Find the length marked by the letter “x” in the following figure:



- (b) The perimeter of a regular octagon inscribed in a circle is 88cm. Find the radius of the circle.

6. (a) If 12 men can build a house in 15 days. How many days will 20 men take to build the same house working at the same rate?
- (b) Haroun is paid Tshs 1800 per hour. How much is he paid after working for 336 minutes?
7. (a) A shopkeeper mixes 3kg of groundnuts worth Tsh 3000 per kg with 2kg of cashew nuts worth Tsh 5000 per kg.
- (i) What is the cost price per kg of the mixture?
- (ii) If he sells the mixture at Tsh 4200 per kg, does he make a profit or a loss? What is the percentage?
- (b) Given the following information related to the ABC business
- | | | |
|-----------|------------|-----------|
| Stock | 01/01/2024 | 40,000/= |
| | 31/12/2024 | 60,000/= |
| Purchases | | 105,000/= |
| Sales | | 160,000/= |
- Calculate:
- (i) The cost of goods sold.
- (ii) The average stock.
- (iii) Gross profit.
8. (a) The arithmetic mean of the numbers is 15, and the geometric mean of the same numbers is 9. Find the numbers.
- (b) How much should Zaina deposit in a bank at 10% compounded quarterly in 5 years in order to get a total amount of 60,000/=?
9. (a) The triangle ABC has sides 9cm, 12cm, and 15cm.
- (i) Prove it is right-angled.
- (ii) Find the area of a triangle using trigonometry.
- (b) A boat is 220m away from a lighthouse, which is 40m high. Find the angle of depression of the boat as seen from the top of the lighthouse.
10. (a) Solve for the value of x : $\frac{x-3}{x+2} = \frac{x+1}{x-4}$.
- (b) Abdallah owns 21 domestic animals. Each of his domestic animals is either a goat or a chicken. Suppose the domestic animals have a total of 76 legs. Find the number of goats and the number of chickens that he owns.

SECTION B (40 Marks)

Answer **all** questions in this section

11. (a) The doctor at Muhimbili Referral Hospital recorded the weight of patients as follows:

Weight	15 – 20	21 – 26	27 – 32	33 – 38	39 – 44	45 – 50
Number of patients	4	6	14	6	2	8

- (i) By using the Assumed Mean of 29.5, determine the mean.
- (ii) Determine the value of the mode.
- (iii) Determine the value of the median.

- (b) A pendulum of length 26cm moves through an angle of 26° . What is the length of an arc made by its tip in one swing?

12. (a) Two towns, A and B, are located at $(10^\circ\text{S}, 38^\circ\text{E})$ and $(10^\circ\text{S}, 43^\circ\text{E})$ respectively:

- (i) Find the distance between two towns in kilometers.
- (ii) Suppose a ship is sailing at 50km/hr from town A to town B. Using the answer obtained in part a (i) above, find how long the ship will take to reach town B.

- (b) VABCD is a right pyramid with $VA = VB = VC = VD = 5\text{cm}$, and ABCD is a square with base 4cm at point N. Find:

- (i) The angle that VA makes with the base.
- (ii) The height of the pyramid.

13. (a) If $A = \begin{bmatrix} 3 & 5 \\ 4 & -2 \end{bmatrix}$. Find $A^2 + 2A$.

- (b) Find the value of x if $p = \begin{bmatrix} x & -3 \\ x & x \end{bmatrix}$ has $|p| = -2$.

- (c) A transformation T takes every point (x, y) into (x', y') such that $x' = 2+x$ and $y' = y$. Find:

- (i) The value of T.
- (ii) The image of (-3,4) under T, then followed by reflection in the line $y-x = 0$.

14. (a) Given that $h(x) = ax^2 + 4x$. Find:

- (i) The value of "a" if $h(-1) = 3$.
- (ii) The domain and range of $h(x)$.

- (b) A company produces batteries A and B. Each A needs 3 hours on machine I and 2 hours on machine II. B needs 4 hours on machine I and 1 hour on machine II. Machine I is available in 120 hours, and machine II is available in 50 hours. If battery A earns a profit of 10,000 shs and machine B earns a profit of 12,000 shs. Find the maximum profit.