

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
FORM THREE MID - TERM EXAMINATIONS
DOVYA SECONDARY SCHOOL
BASIC MATHEMATICS

041

TIME: 3:00HRS

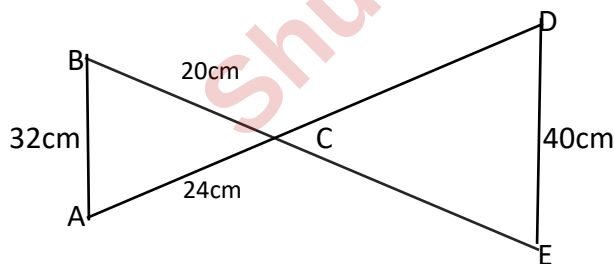
31st AUGUST 2026

Instructions

1. This paper consists of section A and B
2. Answer ALL questions in this paper
3. Non-programmable calculators may be used.

SECTION A (60 marks)

1. (a) What is the smallest number that when separately divided by 20 and 48 gives the remainder of 7 every time?
(b) In a form three class, 5% of the students can play football, $\frac{1}{4}$ can play volleyball, 0.1 can play basketball and $\frac{3}{5}$ can play tennis. Arrange these numbers in descending order
2. (a) In a group of 29 tourists from different countries, 17 went to Manyara National Park, 13 went to Mikumi National Park and 8 went to neither Manyara nor Mikumi National Park. How many tourists went to both National Parks?
(b) By rationalizing the denominator, simplify the following operation $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{5}+\sqrt{3}}$
3. (a) If $(3^{x+1})x(2^{2y+9}) = 69984$ find the value of $x + y$
(b) Write the number 0.009765 (i) Correct to three decimal places
(ii) Correct to three significant figures
(iii) State the place value of 9 in the given number.
4. (a) Find the value of x if $\log_3 x + \log_4 x = \frac{2}{\log 3} + \frac{2}{\log 4}$
(b) The slope of the line $ay + (a + 1)x - 5 = 0$ is 2. Find the value of a . Hence determine the y -intercept
5. (a) A ball of radius 5m rolls along the ground 100 times; (i) How far has it travelled?
(ii) How many times must the ball roll for it to cover 157m? (take $\pi=3.14$)
(b) Given that $\triangle ABC$ is similar to $\triangle EDC$ and also calculate the length of EC and CD



6. (a) Study the following table and answer the question that follows

Hours Worked	2	3	4	5
Earning (TSH)	1150	1725	2300	2875

- (i) Do earnings vary directly as the number of hours worked?
- (ii) If so, calculate the constant of variation and write an equation that describes the relationship.
- (b) A car travels 60km using 5 litres of diesel. How many litres of diesel are needed to travel 150km?
7. (a) The following information is related to Mapemba's Big Company as at 31st December, 2026.
Sales Tsh. 10,000,000 Purchases $\frac{3}{2}$ of opening stock
Opening stock 30% of sales Closing stock 12.5% of sales
Expenses 0.2 times the gross profit
Calculate (i) Cost of goods sold. (ii) Gross profit (iii) Net profit

(b) Mr. Chibwana started business on 1st January 2020 with capital of Tsh 5,000,000/= in cash

January 2 Purchased goods and paid in cash Tshs 1,000,000/=

3 Bought good for cash Tshs 500,000/=

5 Paid wages in cash Tshs 50,000/=

7 Sold goods in cash Tshs 300,000/=

8 Bought goods in cash Tshs 800,000/=

9 Received loan from CRDB Tshs 70,000/=

12 Bought parking materials in cash Tshs 20,000/=

28 Paid carriages (transport charges) Tshs 30,000/=

28 Drew cash for himself Tsh 10,000/=

Prepare cash account and balance it the above information.

8. (a) A car whose original value was US dollar 25600 decreases in value by US dollar 90 per month. How long will it take for the car's value falls up to US dollar 14980?
- (b) Ms. Kigundula deposited Tsh. 2,000,000/= in bank at the rate of 8% compounded annually for 2 years.
- I) Find how much does she receive as a compounded interest at the end of the second year.
- II) Calculate the interest after 2 years.
9. (a) A building has an angle of elevation of 35° from point A and angle of elevation of 45° from point B. If the distance between A and B is 30m, what is the height of the building?
- (b) Given that $(2x - 10)^\circ$ and $(x - 5)^\circ$ are complementary angle find the value of x .
10. (a) If $kx^2 + 24x + 16 = 0$ is a perfect square, find the value of k .
- (b) The factors of a quadratic equation $2x^2 - bx + 3 = 0$ are $(ax - 1)$ and $(x - 3)$ find the value of "a" and "b".

SECTION B: (40 MARKS)

11. (a) Esther Luxury Bus leaves Mbagala Bus Terminal (5°S , 39°E) to Singida Misuna Bus stand (12°S , 39°E) at 8:00 a.m on Monday and travels at a constant speed of 40km/h, at what time will the bus arrive Singida Bus stand?
- (b) The location of Morogoro is 7°S , 38°E and that of Dar es Salaam is 7°S , 39°E . Find the distance between them in both kilometres and nautical miles.
12. (a) The function f is defined as follows:
$$f(x) = \begin{cases} x & \text{if } x > 2 \\ 2 & \text{if } -2 < x \leq 2 \\ x + 4 & \text{if } x \leq -2 \end{cases}$$
- (I) Sketch the graph of $f(x)$
- (II) State the domain and range of $f(x)$
- (III) Use the graph to find $f(-5)$, $f(-1.5)$ and $f(0.5)$
- (b) Given $f(x) = x^2 - 8x + 5$ write the function in form of $f(x) = a(x + b)^2 + c$, where a , b and c are constants. Hence use the form to determine
- (i) The axis of symmetry
- (ii) Maximum or minimum value
- (iii) Turning point
- (iv) Domain and range of $f(x)$
13. (a) Find the image of the point $P(3, 5)$ after rotation of 270° about the origin in anticlockwise direction.
- (b) Let $R = \{(x, y) : x + y \leq 2 \text{ and } y \leq 2\}$ be a relation of a real numbers. Draw a graph of relation R and state its domain and range.
14. The scores of students in mathematics for 50 students were recorded as follows

Marks	72	77	82	87	92	97
Frequency	10	12	14	x	4	5

- I. Find the value of x
- II. Prepare a frequency distribution table with class intervals, real limit and cumulative frequency
- III. State the median class and find median.