

MATHEMATICS

Date: 12/June/2025

Period: 8:30 AM-11:30 AM



END OF TERM III EXAMINATIONS

GRADE: SENIOR ONE
OPTION: ORDINARY LEVEL

DURATION: 3 HOURS

MARKS: / 100

INSTRUCTIONS

- 1) This paper contains **two** sections:
Section A: Answer **all** questions. (55 marks)
Section B: Attempt **three** questions only. (45 marks)
- 2) You may use mathematical instruments and a calculator **where necessary**.
- 3) Use a **blue or black ink pen only** to write your answers and a **pencil** to draw diagrams.
- 4) Show clearly all the working steps where it is necessary.

SECTION A: ANSWER ALL QUESTIONS.**(55 marks)**

- 1) Consider the set $S = \{2, 4, 6, 8, 10\}$.

Answer by true or false for each of the following statements: **(4 marks)**

- a) $2 \in S$:
b) $7 \notin S$:
c) $10 \subset S$:
d) $S \subset \{2, 10\}$:

- 2) Write the following set in roster form and circle the correct answer.

$A = \{x : x \text{ is an integer and } -3 < x \leq 7\}$ **(4 marks)**

- a) $A = \{-3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7\}$
b) $A = \{-3, -2, -1, 0, 1, 2, 3, 4, 5, 6\}$
c) $A = \{-2, -1, 0, 1, 2, 3, 4, 5, 6, 7\}$
d) $A = \{-2, -3, 0, 1, 2, 3, 4, 5, 6\}$

- 3) State whether the pairs sets below are equivalent, equal or neither.

(4 marks)

- a) Set of positive integers and set of natural numbers:
b) $\{b, z, a\}$ and $\{z, a, b\}$:
c) $\left\{\frac{3}{7}, 3, 7\right\}$ and $\left\{\frac{7}{3}, 7, 3\right\}$:
d) $\{\text{letters in the word "mathematics"}\}$ and $\{\text{letters in the word "thematics"}\}$:

- 4) What is the difference between the temperatures 25°C and -7°C ?

Circle the correct answer.

(3 marks)

- a) 32°C
b) 18°C
c) -32°C
d) -18°C

5) State the properties of operations used in the following: **(4 marks)**

- a) $(14 + 27) + (-10) = 14 + (27 + (-10))$:
- b) $77(13 - 33) = 77(13) + 77(-33)$:
- c) $(-71) \times (1000) = (1000) \times (-71)$:
- d) $\frac{35 + 98}{1} = 35 + 98$:

6) Answer by **yes** or **no**.

Is each of the following equalities a linear function? **(4 marks)**

- a) $y = \sqrt{3}x + \frac{1}{2}$:
- b) $y = \sqrt{x} - 9$:
- c) $y = x^2 - 1$:
- d) $x = -3$:

7) Choose and circle the correct answer.

The gradient of the line whose equation is given as $3y - 6x - 12 = 0$ is:

(2 marks)

- a) 3
- b) -6
- c) -12
- d) 2

8) A woman earns three times as much as her husband. After spending three fifths of their combined income, the couple have 100,000 Frw left.

How much does the woman earn?

(4 marks)

Circle the correct answer.

- a) 62,500 Frw
- b) 100,000 Frw
- c) 187,500 Frw
- d) 250,000 Frw

- 9) A mobile money agent received a commission of 63,000 *Frw* for a transaction worth 1,500,000 *Frw*. Find the rate of agent's commission.
Circle the correct answer. **(3 marks)**

- a) 42.00 %
- b) 4.38%
- c) 4.20 %
- d) 4.03%

- 10) Answer by True or False. **(4 marks)**

- a) Two lines which are parallel to the same line are parallel to each other:
- b) Two angles are said to be complementary, If the sum of their measure is 180° :
- c) Two lines in a plane which are perpendicular to the same line are parallel to each other:
- d) Angles which share a common vertex and add up to 360° are called angles at a point:

- 11) Complete the statements below with a word from the following list:
reflex angle; collinear; straight angle; points.

(4 marks)

- a) A line is a set ofwhich are joined together.
- b) An angle less than 360° and greater than 180° is called
- c) points lie on the same line.
- d) Interior angles of a triangle add up a

- 12) Find the value of y and circle the correct answer, if $3y$, $5y$ and 52° are three angles on a straight line. **(3 marks)**

- a) $y = 16^\circ$
- b) $y = 4.75^\circ$
- c) $y = 38.5^\circ$
- d) $y = 128^\circ$

- 13) A paper label just covers the curved surface of a cylindrical container of diameter 35 cm and height 20 cm . Calculate the area of the paper label. Take $\pi = \frac{22}{7}$.

Circle the right answer. **(3 marks)**

- a) $1,100\text{ cm}^2$
 - b) $2,200\text{ cm}^2$
 - c) $4,125\text{ cm}^2$
 - d) $4,400\text{ cm}^2$
- 14) Circle the best answer.
- A solid hemisphere of radius 6.3 cm has density 10.5 g / cm^3 .
- Using $\pi = \frac{22}{7}$, calculate the volume (V) and the mass (M) in kg of the solid. **(4 marks)**
- a) $V = 523.908\text{ cm}^3$ and $M = 5.501\text{ kg}$
 - b) $V = 523.908\text{ cm}^3$ and $M = 55.010\text{ kg}$
 - c) $V = 261.954\text{ cm}^3$ and $M = 5.501\text{ kg}$
 - d) $V = 83.16\text{ cm}^3$ and $M = 5.501\text{ kg}$

15) Pater spent $\frac{1}{3}$ of his salary on food, and $\frac{1}{6}$ of the remainder on the transport.

a) What fraction of his money was left? **(3 marks)**

b) If he was left with 150,000Frw, how was his salary? **(2 marks)**

SECTION B: ATTEMPT ANY THREE QUESTIONS. (45 marks)

16) a) Solve the simultaneous linear inequalities:
 $x - 4 \leq 3x + 2 \leq 2(x + 5)$ **(5 marks)**

b) Mr. HOUBEN plans to buy a car 21 months from now. At present he has saved 450,000 Frw. The cheapest car he can buy costs 3,600,000 Frw. What is the minimum amount that must he save per month for this period of time to be able to buy such a car? **(5 marks)**

c) Find the equation of a line passing through the points $A = (2, 6)$ and $B = (-1, -3)$. **(5 marks)**

17) a) Given that x is inversely proportional to y , copy and complete the following table. **(4 marks)**

x	1	2	4	8	16	32	64
y		16		4		1	

b) Lyra is 18 years old, Ammar is 16 years old and Effie is 10 years old. Their father leaves them 528,000 Frw to be shared in the ratio of their ages.

How much will each child get? **(7 marks)**

c) A man and his wife share a sum of money in the ratio 3:2. If the sum of money is doubled, in what ratio should they divide it so that the man still receives the same amount? **(4 marks)**

18) a) Write down five numbers less than ten such that the mean is 6, the median is 5 and the mode is 4. **(5 marks)**

b) Seven pieces of luggage have masses of 48 kg, 45 kg, 49 kg, 63 kg, 57 kg, 44 kg, and 51 kg.

(i) Find the mean mass of the seven pieces. **(3 marks)**

(ii) If the lightest and the heaviest pieces are taken away, what is the mean mass of the remaining ones? **(3 marks)**

(iii) What is the median mass of the seven pieces? **(1 mark)**

(iv) What is the median mass if the lightest piece is removed? **(3 marks)**

19) In a certain class, the marks obtained in mathematics test out of 20 are represented as follow:

12, 14, 15, 12, 16, 17, 12, 18, 14, 15, 16, 14, 15, 18, 14, 15, 16, 17, 18, 16, 17, 16, 18, 16, 17.

a) Draw a frequency distribution table. **(5 marks)**

b) What is the probability that a student chosen at random has:

(i) Exactly 18 mark? **(2 marks)**

(ii) Less than 18 mark? **(2 marks)**

- (iii) More than 15 mark? **(2 marks)**
- (iv) Less than 12? **(2 marks)**
- (v) x marks such as $12 \leq x \leq 18$? **(2 marks)**
- 20) Consider two observations arranged in ascending order:
13, 15, 19, 31, $x + 19$, $x + 35$, 60, 62, 70, 75
and
11, 12, 14, 18, $x + 2$, $x + 4$, 26, 28, 30, 35
- Evaluate their means if the median of the first is twice the median of the second observation. **(15 marks)**