R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2021

MATHEMATICS

2021

NATIONAL EXAMINATION BOARD

SomExams

Total Score

Name _____

School _____

Roll No _____

Republic of Somaliland

Somaliland National Examination Board

Form Four certificate examination

MATHEMATICS
PAPER ONE

2020 - 2021

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 8 printed pages
Count them now Inform the invigilator if there are any missing pages

PART 1	20 Multiple Choice Questions	40 Marks
PART 2	10 Structured Questions	60 Marks
		TOTAL 100 Marks

- Answer ALL questions in Part 1 and 2
- Extra papers and Mobile Not Allowed

(20 x 2 = 40 marks)

PART ONE Multiple Choice

Choose the correct answer. **Answer ALL the questions. Each question carries 2 marks**

1. $2 \times 90 \div 10 \times 2 + 9 - 10$ is

   A) 55 B) 35 C) 45 D) 25

2. If $y - 2x + 5 = 0$, the slope is

   A) 2 B) 5 C) -2 D) -5

3. Simplify $\frac{35}{240}$

   A) 3.5 B) $\frac{7}{30}$ C) 2.4 D) $\frac{5}{30}$

4. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $\begin{bmatrix} 3 & 5 \\ 4 & 6 \end{bmatrix}$ then $A + B$ is equal to

   A) $\begin{bmatrix} 2 & 7 \\ 4 & 6 \end{bmatrix}$ B) $\begin{bmatrix} 7 & 2 \\ 6 & 4 \end{bmatrix}$ C) $\begin{bmatrix} 7 & 4 \\ 10 & 7 \end{bmatrix}$ D) $\begin{bmatrix} 4 & 7 \\ 7 & 10 \end{bmatrix}$

5. If $f(x) = 2x + 1$, then $f^{-1}(5)$ is

   A) 5 B) 3 C) 4 D) 2

6. Write 4.8916 to three decimal places

   A) 489.2 B) 4.89 C) 489 D) 4.892

7. 240^0 is equal to

   A) $\frac{3\pi}{4}$ B) 2π C) $\frac{4\pi}{3}$ D) $\frac{5\pi}{4}$

8. If $y = 2x^3 - 1$, then $y(2)$ is

   A) 15 B) 23 C) 24 D) 20

9. If $g(x) = (x^2 + 1)^5$ then $g'(x)$ is

   A) $6(x^2 + 1)^5$ B) $12x(2x + 1)^5$ C) $6(x + 1)^5$ D) $12x(2x + 1)^5$

10. $\int (3x^2 - 1)dx$

    A) $3x^2 - x + c$ B) $3x^3 - x + c$ C) $x^3 - x + c$ D) $10(5x + 2)$

11 i^{2000} is

A) 1 B) i C) -1 D) $-i$

12 $(i+1)(i-2)$ is =

A) $+3-i$ B) $-3-i$ C) $3+3i$ D) $2+i$

13 $\lim x \to 6 \frac{x^2-36}{x^2-4x-12}$

A) $\frac{5}{2}$ B) $\frac{1}{2}$ C) $\frac{3}{2}$ D) $\frac{7}{2}$

14 If $f(x) = \tan 3x$, than $f'(x)$

A) $3\cos^2 3x$ B) $\sec^2 3x$ C) $3\sin^2 3x$ D) $3\sec^2 3x$

15 A fair die is tossed once. The probability that an event of an odd number appears is.

A) $\frac{2}{6}$ B) $\frac{3}{6}$ C) $\frac{1}{6}$ D) $\frac{4}{6}$

16 The math test scores were 40, 36, 50, 65, and 60 , the percentile rank of 20 is :

A) 40 B) 60 C) 50 D) 36

17 ${}_5P_2$ is :

A) 20 B) 26 C) 24 D) 28

18 Cos 105^0 is equal to :

A) $\frac{\sqrt{2}}{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $+\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$

19 $\int_0^1 (x^5-1)(x^4)dx$ is :

A) 0 B) $-\frac{2}{5}$ C) $-\frac{2}{5}$ D) $\frac{-2}{20}$

20 If $y = x^3 - 6x^2 - 15x$, then the maximum point is :

A) (- 5, -200) B) (-1, 8) C) (5, -100) D) (1, 8)

Part Two :10 Structured Questions **(60 marks)**

1 a) Write 0.37 in fraction form (2 marks)

b) Use division to convert the fraction into decimal for $\frac{3}{4}$ (2 marks)

c) Calculate the value of 3^7 (2 marks)

2 a) Find the solution set for $x - 2 \leq 2x - 6$ (2 marks)

b) Solve $\frac{x}{2} - 1 = 8$ (2 marks)

c) Evaluate $4^2 + 3^3$ (2 marks)

3 The rate of sales tax for onion is 75% , If 10 bags of Onion costs $ 2000 before the sales tax is added , calculate

a) The selling price for 10 bags? (2marks)

b) The total amount of tax paid for 100 bags of Onion ? (2 marks)

c) The total amount of tax paid for 1 bag of Onion? (2 marks)

4 Evaluate the following limits

a) $\lim_{x \to 0} x^2 - 2x + 1$ (2 marks)

b) $\lim_{x \to 5} \frac{x^2 - 25}{x^2 - 6x - 5}$ (2 marks)

c) $\lim_{x \to 8} \frac{x^2 - 1}{2x^2 + 5}$ (2 marks

5 A box contains 4 red and 6 black balls. If one ball is drawn random ,what is the probability of getting

a) Neither red nor black (2marks)

b) Red ball (2 marks)

c) Black ball (2 marks)

6 Evaluate

a) 6 ! (2 marks)

b) $5P_3$ (2 marks)

c) $10C_5$ (2 marks)

7 Simplify the following

a) $i^6 + i^2$ (2 marks)

b) $(4 + 6i)(4 - 6i)$ (2 marks)

c) $(2 + 5i)(2 - 26i)$ (2 marks)

8. For the following functions find the derivative of

a) If $f(x) = x^3 - 2x + 1$, $f'(2) = ?$ (2 marks)

b) If $g(x) = (x + 1)(x^2 - 1)$, $g'(x) = ?$ (2 marks)

c) If $k(x) = 5(x^3 - 1)^6$, $k'(x) = ?$ (2 marks)

9) Integrate the following

a) $\int (x^5 - 2x + 1)\, dx$ (2 marks)

b) $\int x^2 (x^3 - 2)\, dx$ (2 marks)

c) $\int \sin 5x\, dx$ (2 marks)

10) The table below shows the mass of rice sold by 20 shopkeepers in a town

Mass in Kgs	Frequency
$10 < m \leq 30$	3
$30 < m \leq 50$	4
$50 < m \leq 70$	6
$70 < m \leq 90$	5
$90 < m \leq 110$	2

Calculate

a) Lower Quartile of the data set (2 marks)

b) Middle quartile of the data set (2 marks)

c) Upper quartile of the data set (2 marks)

END