R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2018

MATHEMATICS

2018

NATIONAL EXAMINATION BOARD

SomExams

Total Score

Name.....

School .....

Roll No .....

Republic of Somaliland

Somaliland National Examination Board

Form Four

MATHEMATICS
PAPER ONE

JUNE 2018

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 12printed pages.
Count them now. Inform the invigilator if there are any pages missing.

PART 1:	30 Multiple Choice Questions	60 Marks
PART 2:	6 Structured Questions	40 Marks
		TOTAL 100 Marks

- Answer ALL questions in Part 1 and 2.
- All answers must be written on this paper in the spaces provided immediately after each question. Only write on this exam paper.

Use this page for rough work. It will NOT be marked.

PART ONE: Multiple Choice **(60 marks).**

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

1. The gradient of the line $2y = 4x + 3$ is:

   A) 3 B) 2 C) 8 D) $\frac{3}{2}$

2. If $f(x) = 2x + 5$, then $f(3)$ is equal to :

   A) 7 B) 9 C) 11 D) 6

3. Simplified i^{41} becomes :

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

4. Lim 4^3 gives
   $x \rightarrow 2$

   A) 0 B) 64 C) 128 D) -1

5. Simplify $\frac{3 - i}{2 + i}$

   A) $1 + i$ B) $i - 1$ C) $1 - i$ D) $i^2 + 1$

6. The inverse of $f(x) = 3x + 2$ is :

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

7. $(1 - i)(1 + i)$ is equal to :

   A) $1 - i$ B) $1 + i$ C) 2 D) 1

8. The mean of 2, 4, 6, 10, 8, 12, 14, is

   A) 7 B) 8 C) 9 D) 6.

9. The distance between A (3, 5) and B (7, 8) is

A) 3 B) 4 C) 5 D) 6

10. The coordinates of the midpoint of (2, 4) and (3, 5) is :

A) $\left(\frac{1}{2}, \frac{1}{2}\right)$ B) $\left(\frac{5}{2}, \frac{9}{2}\right)$ C) (3, 10) D) $\left(\frac{7}{2}, \frac{7}{2}\right)$

11. Find the value of x and y in $3x - 5yi = 15 - 20i$:

A) (5, -4) B) (-5, -4) C) (5, 4) D) (-5, 4)

12. The interquartile range for 8, 11, 13, 15, 18, 26, 29, 31, 33, 36, is :

A) 22 B). 18 C). 2 D). 3

13. y is directly proportional to x. If x = 3 when y = 12,then the constant of proportionality is:

A) 3 B). 4 C). 6 D). 12

14. Convert 270^0 to radian measure :

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

15. Convert $\frac{11\pi}{6}$ to degrees:

A) 130^0 B). 230^0 C). 330^0 D). 110^0

16. Decrease 40 in the ratio 3:4 .

A) 25 B). 30 C). 35 D). 20

17. If a number is chosen at random from 1- 14 what is the probability that the number chosen is odd:

A) $\frac{3}{7}$ B). $\frac{6}{13}$ C). $\frac{1}{2}$ D). $\frac{1}{3}$

18. Evaluate ${}^{9}P_{3}$ is:

A) 72 B). 504 C). 56 D). 1008

19. Given Sin $\theta = \frac{7}{24}$ find tan θ:

A) $\frac{7}{22}$ B). $\frac{22}{7}$ C). $\frac{22}{24}$ D). $\frac{24}{22}$

20. The directrix of the parabola $y = 16x^2 + 2$ is :

A) 16 B) 2 C) -4 D) 4

21. N % of 4800 is 576 , the value of N is :

A) 15 B) 13 C) 11 D) 12

22. The stationary point of $y = -x^2 + 3x$ is :

A) $(\frac{3}{2}, \frac{9}{4})$ B) $(\frac{3}{2}, 0)$ C) (3,18) D) $(\frac{-3}{2}, \frac{-9}{4})$

23. The derivative of y = sec x is :

A) $\tan^2 x$, B) secxtanx. C) $\sec^2 x$ D) $\frac{-\sin x}{\cos^2 x}$

24. $\int \sqrt{x^3}\,dx$:

A) $\frac{2}{5}\sqrt{x^5} + c$ B) $\frac{1}{5,}x^2 + c$ C) $\frac{2}{3,}x^2 + c$ D) $x^2 + c$

25. If you roll two dice, the probability of getting a sum of 7 is :

A) $\frac{7}{36}$ B) $\frac{6}{36}$ C) $\frac{5}{36}$ D) $\frac{4}{36}$

26. A proposition is a statement that is :

A. true B) false C) true or false D)both true and false

27. ${}^{10}C_2$ is equal to :

A. 45 B) 90 C) $\frac{10!}{2!}$ D) 8!

28. The height of a tree is 170 m. The lower and upper bound of its height is :

A. 169 and 171 B) 169.5 and 170.5 C) 160 and 170 D) 165 and 175

29. Given $\sin\theta = \frac{5}{13}$, find $\cos\theta$ =

A. $\frac{6}{13}$ B) $\frac{7}{13}$ C) $\frac{11}{13}$ D) $\frac{12}{13}$

30. If 10men build a house in 5 days, then 8 men will finish the building in :

A) 7 days B) 7.5 days C) 8 days D) 8.5 days

Part Two:6 Structured Questions (40 marks)

1. Find the mean , median and mode of the data in the following table : (7 marks)

Items (x)	1	2	3	4
Frequency (f)	6	5	10	7

2. A curve whose equation is $y = ax^2 + c$ passes at a point (2, 13) with gradient 4. Find the values of **a** and **c**. (6 marks)

3. Given the equation of the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ (6 marks)

   Find: a) the radius of the circle

   b) the centre of the circle

4. Given $Z_1 = 4 (\cos 60^0 + i \sin 60^0)$

$Z_2 = 6 (\cos 30^0 + i \sin 30^0)$

Calculate: a) $Z_1 . Z_2$ b) $\frac{Z1}{Z2}$ both in polar and rectangular forms

5. A particle has a velocity of $v = 5t^2 - 2t^3$ in m/s.

   Find the a) acceleration after 5 secs.

   b) distance moved after 5 secs. (6 marks)

6. The sales tax for kat is 70%.If 10 bags cost $ 3000 before sales tax is added, calculate a) the selling price for the 10 bags ?
b) the total amount of tax paid for 100 bags of Kat. (7marks)

END