R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2017

# MATHEMATICS

2017

NATIONAL EXAMINATION BOARD

SomExams

Total Score

Name.....

School .....

Roll No .....

**Republic of Somaliland**

**Somaliland National Examination Board**

**Form Four**

# MATHEMATICS
## PAPER ONE

**Paper One ( CORE MATHEMATICS )**

**JULY 2017**

**TIME 2 HOURS**

**Plus 10 minutes for reading through the paper**

**INSTRUCTIONS TO CANDIDATES**

This paper consists of 11 printed pages.
Count them now. Inform the invigilator if there are any pages missing.

| | | |
|---|---|---|
| PART 1: | 30 Multiple Choice Questions | 60 Marks |
| PART 2: | 8 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 angle of $620^0$ lies on the quadrant of

   A) First quadrant B) Second quadrant

   C) Third quadrant D) Fourth quadrant

2. The conversion of the $\frac{5\pi}{6}$ to degree is :

   A) $120^0$ B) $135^0$ C) $24^0$ D) $150^0$

3. The length of arc of radius 9 cm, that is subtending an angle of $40^0$ at the centre is :

   A) $2\pi$ B). $\frac{3\pi}{2}$ C). $\frac{5\pi}{2}$ D). $6\pi$

4. The reference of sin $150^0$ is :

   A. $30^0$ B. $60^0$ C. $90^0$ D. $45^0$

5. The value of sin $135^0$ is :

   A $\frac{1}{\sqrt{2}}$ B. 3

   C 1 D. $\frac{\sqrt{3}}{2}$

6. The identity $\sin^2 x + \cos^2 x$ is equal to :.

   A. -1 B. $\sqrt{3}$ C. 1 D. 0

7. Lim $X \rightarrow 3$ $\left(\frac{2x + 4}{x + 2}\right)$

   A $\frac{7}{5}$ B. $\frac{6}{5}$

   C 5 D. 2

8. The differentiation of $y = 3x^3 - 1$ is :

A. $9x^2$ B. $9x^2 - 1$ C. $3x^2$ D. $6x^2 - x$

9. The gradient of the cure $y = 4x^2 + 2$, at $x = 1$ :

A. 8 B. 4 C. -16 D. $\frac{1}{2}$

10. The derivative of $f(x) = 5\sin 2x$ is :

A. -10 cos2x B. 10 cos2 x C. -5 sin2 x D. 5 cos2 x

11. The integration of $\int f(x^2+x-4)dx$ is:

A. $\frac{x^3}{2} + x^2 - 4$ B. $\frac{x^4}{3} + \frac{x^3}{3} + C$

B. $\frac{x^4}{4} + \frac{x^2}{2} - 4x + c$ D. $\frac{x^3}{3} + \frac{x^4}{2} - 4 + C$

12. The mode is :

A. The middle value of the items B. The maximum frequency of the items

C. The largest value of the items D. The minimum value of the Items

13. The range of the following items: 12, 17, 10, 29, 3, 6, 21 is :

A. 28 B. 26 C. 30 D. 12

14. The $90^{th}$ percentile of 25, 27, 30, 38, 40 is :

A. 40 B. 38 C. 30 D. 27

15. 10% of 445 is :

A. 4.045 B. 4.45 C. 0.445 D. 44.5

16. The value of the definite integral : $\int f^1(3x-1)dx$ is:

A. $\frac{1}{2}$ B. $\frac{3}{2}$ C. 1 D. 0

17. The value of cos ( 60 + π ) is:

A. 0 B. $\frac{3}{\sqrt{2}}$ C. $-\frac{1}{2}$ D. $\frac{1}{\sqrt{2}}$

18. lim $x^3 + 5x$ is :
$x \to \infty$

A. $\infty$ B. $-\infty$ C. 5 D. $X^3$

19. $I^{19}$ is equal to :

A. - i B. + i C. 1 D. – 1

20. ( 4- 3 i) + ( 7 + 5 i) is equal to :

A. 11 + 8i B. 11 – 8i C. 11 – 2i D. 11 + 2 i

21. ( 2 + 3i ) ( 2 – 3i) is equal to :

A. 13 B. -5 C. -13 D. 12

22. The solution of $X^2 + 1 = 0$ is :

A. I B. – i C. -1 D. 1

23. If z = 3 + 4 i the radius is :

A. 1 B. 7 C. 5 D. -7

24. The argument of $Z = 1 + \sqrt{3}\ i$ is :

A. $30^0$ B. $90^0$ C. $60^0$ D. $45^0$

25. A box contains 4 white and 3 black balls. If one ball is drawn at random , the probability of getting a white ball is :

A. $\frac{1}{7}$ B. $\frac{4}{7}$ C. $\frac{4}{3}$ D. $\frac{3}{7}$

26. If a die is rolled, the probability of getting an even number is :

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

27. The value of ${}_8P_2$ is :

A. 20 B. 30 C. 15 D. 10

28. The simplification of $\frac{8!}{7! \times 2!}$ is :

A. 15 B. 8 C. 2 D. 4

29. The probability of having a wedding on Friday is :

A. $\frac{1}{30}$ B. $\frac{2}{7}$ C. $\frac{1}{7}$ D. $\frac{1}{12}$

30. The second derivative of $y = x^4 - 2x^3$ is :

A. $4x^2 - 6x^2$ B. $12x^2 - 8$ C. $12x^2 - 12x$ D. $6x^3 - 6x$

## Part Two : 8 Structured Questions (40 marks)

1. The arc subtending an angle of 45 as the contra, find its length if its radius is 8 cm?

2. Find the limits of the following :

a) $\lim_{X \longrightarrow 0} \frac{5x^2}{6x^2}$

b) $\lim_{X \longrightarrow \infty} \frac{3x^2}{x^4}$

3. Find the gradient of the function $f(x)=2x^3-5$ at the points ( 2, 11)

a)

b) Integrate $\int(x^3-x^2-2x-9)dx$

4. Find the standard deviation of the items 5, 6, 7, 8, 9

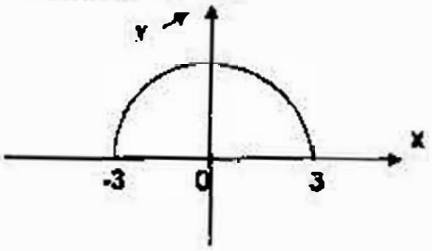
5. A die is rolled and can is tossed. Find the probability of getting 4 on the die and head of the coin?

6. Simplify the following

a) $\frac{1}{2+3i}$

b) Find the value of x and y that make the equation true $3x - 4yi = 18 - 24i$

7. Find the are under the cure y = 9 – x2




8. Find $\phi$ of the following if $0 \angle \phi \angle 90^0$

a) $2 \sin \phi - 1 = 0$

b) $2 \cos \phi - \sqrt{2} = 0$