MATHEMATICS
PAPER TWO

**20
16**

NATIONAL EXAMINATION BOARD

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Republic of Somaliland

Somaliland National Examination Board

Form Four

MATHEMATICS PAPER TWO

(EXTENDED MATHEMATICS)

2015 - 2016

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:   20 Multiple Choice Questions   40 Marks
PART 2:   8 Structured Questions   60 Marks
                          TOTAL   100 Marks

- Answer ALL questions in Part 1 and 2. .

- No extra paper is allowed

Use this page for rough work. It will <u>NOT</u> be marked.

PART one: 40 marks. Answer ALL the questions. Each question carries 2 marks.

Circle the correct answer.

1. If $f(x) = 2x - 1$, $f^{-1}(3)$ is :

   a) 1 b) 2 c) 3 d) 4

2. If $f(x) = x-4$, the domain of $f(x)$ is the set of :

   a) Whole numbers b) Integers

   c) Positive real numbers 5 d) All real numbers

3. The solution of $x - y = 6$ and $3x + y = 2$ is :

   a) [-2, -4] b) [-2, 8]

   c) [2, -4] d) [2, 4]

4. $\log_3 x^2 = 2$ has x equal to

   a) 1 b) 2

   c) 3 d) 4

5. $10c_3$ is

   a) 120 b) 240

   c) 360 d) 720

6. If the 10th term of an arithmetic progression is 21 and the 7th term is 15, the first term is :

   a) 1 b) 2

   c) 3 d) 4

7. Ahmed and Asha shared $ 150 at the ratio 2:3 respectively. Ahmed's share is :

   a) 30 b) 60

   c) 90 d) 120

8. The determinant of matrix $A = \begin{bmatrix} 1 & 5 \\ 2 & 8 \end{bmatrix}$ is

    a) -2   b) 2

    c) 18   d) 38

9. Simplify $\sqrt{72} + \sqrt{50} - \sqrt{128}$, is:

    a) $3\sqrt{2}$ b) $19\sqrt{2}$

    c) $7\sqrt{2}$ d) $9\sqrt{2}$

10. The tangent line to the curve $y = x^2 + 3x - 1$ at the point (1, 3) is :

    a) -5   b) 2

    c) 3   d) 5

11. $\int x^3 \left(x^4 - 1\right)^2 dx$ is:

    a) $\dfrac{(x^4-1)}{4} + c$ b) $\dfrac{(x^4-1)}{3} + c$

    b) c) $\dfrac{(x^4-1)^3}{4} + c$ d) $x^4 \dfrac{(x^4-1)^3}{12} + c$

12. $\dfrac{2\cos A}{Sin2A}$ is equal to

    a) Sin A   b) Cos A

    c) Sec A   d) csc A

13. Sin $\dfrac{7\pi}{2}$ is equal to :

   a) 0   b) -1

   c) ½   d) 1

14. $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{x - 3}$ is

   a) Undefined   b) 0

   c) 3   d) 6

15. The mean of 3, 5, 7, x, 9, 10 is 7, the value of x is :

   a) 7   b) 8

   c) 9   d) 10

16. The third term of the binominal of $(x - 2y)^4$ is :

   a) $24\ x^2 y^2$ b) $24\ x y^3$

   c) $12\ x^2 y^2$ d) $12 x y^3$

17. $(x + 3)(x - 3)$

   a) $x^2 + 9$ b) $x^2 - 9$

   c) $x^2 - 6 + 9$ d) $x^2 + 6 + 9$

18. If $x^2 - 5x + 6 = 0$, the value of x is :

a) (2,3)   b) (-2,-3)

b) (-2,3)   d) (2, -3)

19. The perimeter of the sector is

6 cm   120   6 cm

a) 4π   b) 12π

c) 4π+12   d) 132π
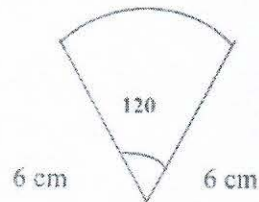
20. The simple interest on $ 80,000 at 15% for 3 years is :

a) $ 36000   b) $ 18000

c) $ 8000   d) $ 24000

Part two: Structured Question   **(60 Marks)**

1. A line passes through the points A (1, 3) and B (-4, -7) find

   a) The midpoint between A and B.   **(2 Marks)**

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   b) The distance between A and B   **(3 Marks)**

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   c) The equation of the line through A and B   **(3 Marks)**

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2. a) Find $(x-3) (x+5)$ **(3 Marks)**

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   b) Divide $x^3 + 5x^2 + 11x + 10$ by $x + 2$.   **(3Marks)**

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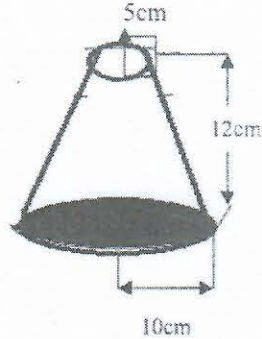
3. The radii of a frustum are 5 cm and 10 cm, and its height is 12 cm. Calculate its:

   a) Volume in terms of π (4Marks)

   b) Surface area in terms of π (4marks)

4. Find out the area between the two curves $y = -x^2 + 3x + 16$ (8 Marks)
   and $y = x^2 + x + 4$

5. a) Solve the trigonometric equation: (4 marks)

   $2\sin x \cos x - \sqrt{3}\sin x = 0$
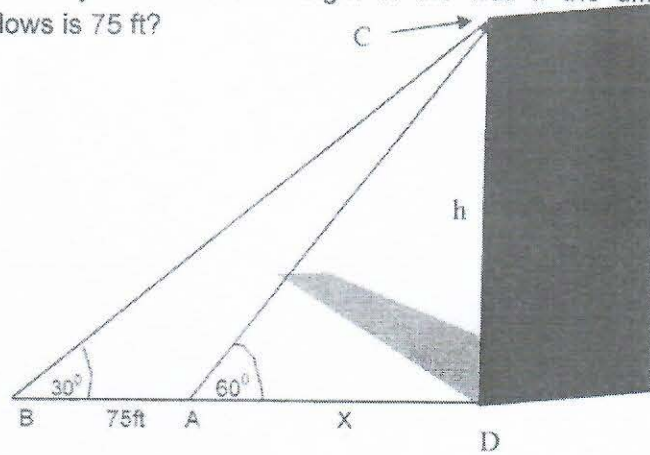
b) The shadow length of two consecutive hours are shown below as A and B respectively. What is the height of the wall if the difference in length of the two shadows is 75 ft? (4Marks)

6. Given the data 8, 11, 13, 15, 18, 26, 29, 31, 33, 36. Calculate the mean, interquantile range and the standard deviation? (8 marks)

7. Given the following figure find :
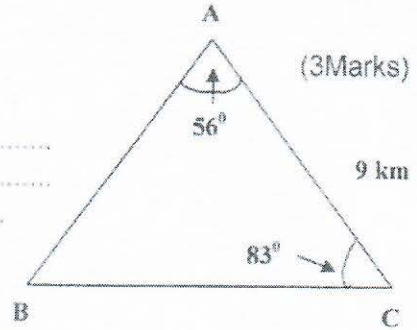   a) Distance AB. (3Marks)

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   b) Distance BC (3Marks)

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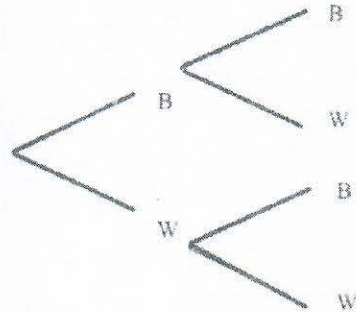
10

8. a) A bag contains 3 blackballs and 2 white balls. A ball is drawn from the bag at random and replaced. A second ball is chosen at random. Using the following tree diagram, what is the probability that (i) both are black, and (ii) one is white and one is black?

(4Marks)

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b) 40 students were tested and obtained the following marks in the below table: Find the mean:

(4Marks)

Marks	0-10	10-20	20-30	30-40	40-50
Freq.Of.Student	4	10	14	8	4

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END

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