EDUCATION-NEWS CONSULT

2024 BECE MOCK 4

MATHEMATICS 1 & 2
2 HRS

Name.....

Index Number.....

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SPECIAL PERFORMANCE BOOSTER – MOCK 4

FEBRUARY 2024 MATHEMATICS 2HRS

Do not open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your name and index number in ink in the spaces provided above.

*This booklet consists of two papers; **I** and **II**. Answer Paper **2** which comes first in your answer booklet and Paper **1** on your Objective Test answer sheet. Paper **2** will last for **1** hour after which the answer book let will be collected. Do not start Paper until you are told to do so. Paper **1** will last 60 minutes.*

VERY IMPORTANT INSTRUCTIONS

1. *Read through the questions, brainstorm and plan your answers before you finally answer them. This is one of the good ways to manage your time in an exam and to do well.*
2. *Write clearly, use simple expressions and provide the best answers possible.*
3. *Write answers that provide additional information. If you just list answers or provide one to three worded answers, your will fail the paper.*
4. *Do well to explain your answers to help earn full marks. Check your units of measurement, spellings, grammar and read over your work before submitting.*
5. *Write question numbers boldly, start every new major question (answers) on a new page.*
6. *Do not rewrite the full question before answering. Only write the question number.*
7. *Show workings in all instances in section B if the question involves calculations.*

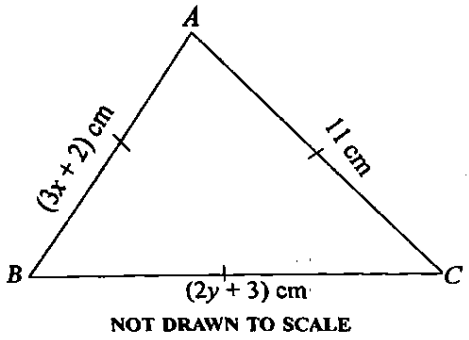
PAPER 2
ESSAY
[60 MARKS]

1 Hour

Answer **four** *questions* **only**. **All** *questions carry* **equal** *marks. All working* **must** *be clearly shown. Marks will* **not** *be awarded for correct answers without corresponding working.*

1. (a) In a class of 30 pupils, 15 have rulers and 13 have pencils. Six pupils have neither ruler nor pencil.
   (i) Draw a Venn diagram to illustrate the information.
   (ii) Find the probability that a pencil chosen at random will have:
   (α) A ruler only;
   (β) both ruler and pencil.

   (b) In the diagram, ABC is an equilateral triangle. Find the value of $(\boldsymbol{x}+\boldsymbol{y})$.



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   (c) Find the sum of $142.3, 0.572$ *and* 47.06.

2. (a) (i) Simplify the surd $\frac{\sqrt{5}\times\sqrt{4}}{\sqrt{5}\times 2}$.
   (iii) The area of a square board is 81cm^2. What is its perimeter?

   (b) Find the gradient of the straight line that passes through the points $A(5,7)$ and $B(11,4)$.

   (c) Given that $\boldsymbol{p}=\begin{pmatrix}\mathbf{2-3x}\\ \mathbf{5-2y}\end{pmatrix}$, $\boldsymbol{q}=\begin{pmatrix}\mathbf{-1}\\ \mathbf{5}\end{pmatrix}$ *and* $\boldsymbol{p}-\boldsymbol{q}=\begin{pmatrix}\mathbf{6}\\ \mathbf{8}\end{pmatrix}$, find the value of $(\boldsymbol{x}+\boldsymbol{y})$.

3. (a) Simplify $\frac{2^8\times 2^3}{4^3\times 2}$, leaving the answer in the form $\frac{a}{b}$, where $\boldsymbol{a}$ *and* $\boldsymbol{b}$ are positive integers.

   (b) Using a ruler and a pair of compasses only, construct a square $ABCD$ of side 6cm. Measure the diagonal $|AC|$.

   (c) Given the point $\boldsymbol{M}(6,4)$ and $\boldsymbol{N}(3,5)$, find $\overrightarrow{\boldsymbol{MN}}$.

4. (a) Thirty-five men can dig a well in 28 days. How many days will 14 men take to dig the well working at the same rate?

   (b) The external angle of a polygon are $30°, 40°, 120°, 142°$ *and* $y°$. Find the value of $\boldsymbol{y}$.

   (c) The median of the ordered set of observations $2, 3, (4\boldsymbol{m}-3), (3\boldsymbol{m}+1), 11$ *and* 13 in ascending order is 6. Find the value of $\boldsymbol{m}$.

5. (a) Factorize: $(x-y)(3m+n)-(x-y)(m-2n)$.

(b) The perimeter of a rectangular cocoa farm is $497km$. The length of the farm is $2\frac{1}{2}$ times the width. Find the:
(i) width;
(ii) length of the farm.

(c) The ratio of sheep to goats on a farm is **4:7**. If there are **1,428** sheep, find how many goats are on the farm.

6. (a) The volume of a cylindrical tin is $1{,}540cm^2$. If the height of the cylinder is 10cm, find its radius. $[Take\ \pi = \frac{22}{7}]$

(b) The table below gives the frequency distribution of the marks obtained in a class test by a group of 64 pupils.

Marks (out of ten)	2	3	4	5	6	7	8	9
Frequency	9	14	13	10	5	8	2	3

(i) Draw a bar chart for the distribution.
(ii) A pupil is chosen at random from the class. What is the probability that the pupil obtained 7 marks?

END OF ESSAY TEST

PAPER 1

OBJECTIVE

Answer all questions.

*Each question is followed by **four** options lettered **A** to **D.** Find the **correct** option for **each** question and shade in **pencil** on your answer sheet the answer space which bears the same letter as the option you have chosen. Give only **one** answer to **each** question. Do all rough work on this question paper.*

1. If you randomly select a card from a standard deck of 52 cards, what is the probability of drawing a heart?

A. $\frac{13}{52}$

B. $\frac{1}{4}$

C. $\frac{26}{52}$

D. $\frac{3}{13}$

*Amina has 34 oranges. She gave 16 of them to Ato and was left with P organges. Use the information to answer questions **2** and **3.***

2. Which one of the following is the correct number sentence?

A. $16 - 34 = P$

B. $34 + P = 34$

C. $34 - 16 = P$

D. $34 + 16 = P$

3. How many oranges will be left?

A. 17

B. 18

C. 49

D. 50

4. Which of the following fractions is larger than $\frac{1}{2}$?

A. $\frac{2}{3}$

B. $\frac{2}{5}$

C. $\frac{1}{5}$

D. $\frac{1}{4}$

5. If you roll two fair six-sided dice, what is the probability of getting a sum of 7?

A. $\frac{1}{6}$

B. $\frac{1}{12}$

C. $\frac{1}{3}$

D. $\frac{1}{4}$

6. When counting backward by 100,000s from 800,000, what number comes before it?

A. 700,000

B. 600,000

C. 750,000

D. 790,000

7. A triangle with vertices at (2, 4), (6, 4), and (4, 8) is reflected over the $x - axis$. Where will the image of the triangle's vertices be located?

A. (2, -4), (6, -4), (4, -8)

B. (2, -4), (6, -4), (4, 8)

C. (2, 4), (6, 4), (4, -8)

D. (2, -4), (6, -4), (4, -8)

8. If the direction of travel is given as a bearing of 230 degrees, what would be the back bearing?

A. 230 degrees

B. 410 degrees

C. 50 degrees

D. 180 degrees

9. Which number comes after 990,000 when counting by 10,000s?

A. 990,010

B. 991,000

C. 991,010

D. 1,000,000

10. There are 2,500 students in a school. If 1,200 students attend a field trip and 800 are in classrooms, how many students are present in the hundreds place?

A. 4

B. 5

C. 6

D. 7

11. Study the number pattern, then find the next number: 1, 2, 4, 12, 44, 332, ____

A. 568

B. 1434

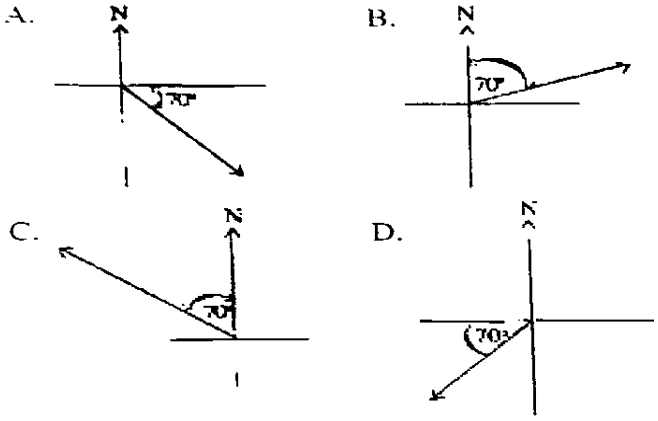
C. 3421

D. 4204

12. Mr. Chee wants his student to guess his age. Mr. Chee is 38 years older than his student. Mr Chee will be three times as old as his student after 5 years. How old is Mr. Chee now?

A. 57
B. 62
C. 19
D. 14

13. A boy walks on a bearing of 070°. Which of the following diagrams shows his direction?



14. 6 years ago, the ratio of John's age to his brother's age was 3:5. This year, the ratio of John's age to his brother's age is 3:4. How old is John now?

A. 24
B. 12
C. 18
D. 16

15. A mango is sliced into three pieces such that, the second piece is three times as large as the first, and the third is twice as large as the second. What fraction of the whole mango is the second piece? Express your answer as a common fraction**.**

A. $\frac{1}{5}$
B. $\frac{2}{5}$
C. $\frac{3}{10}$
D. $\frac{1}{2}$

16. Compute the sum of the digits of the product 455 and 1331.

A. 22
B. 43
C. 13
D. 24

17. On July 30, 2018, in Champaign, Illinois, the sun rose at 5:49 AM and set at 8:08 PM. For how many minutes was the sun in the sky?

A. 922
B. 1039
C. 979
D. 859

18. Given that $(5 + 3\sqrt{2})\,6 - (5 - 3\sqrt{2})\,6 = p\sqrt{2}$. Find the sum of prime factors of p.

A. 120
B. 60
C. 80
D. 100

19. A truck and a car travelled uniformly along an expressway from city M to city N. The truck left at 10:15 and arrived at 14:15. The car left at 11:00 and arrived at 13:45. At what time did the car overtake the truck?

A. 12:39
B. 11. 55
C. 14: 01
D. 15. 15

20. If a line has a slope of 0 and passes through the point (4, -2), what is the equation of the line?

A. $y = -2$
B. $y = -2x$
C. $y = -2 + x$
D. $y = -2 + 4x$

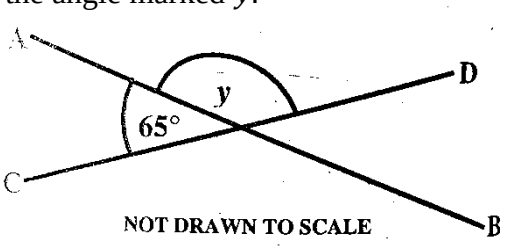
21. Simplify $(2x - 3)(x + 4)$.

A. $2x^2 + 8x - 3x - 12$
B. $2x^2 + 5x - 12$
C. $2x^2 + 5x - 7$
D. $2x^2 + 8x - 12$

22. If point X is at a bearing of 270 degrees from point Y, what is the bearing of point Y from point X?

A. 0 degrees
B. 90 degrees
C. 180 degrees
D. 270 degrees

23. In the diagram below, AB *and* CD are two intersecting straight lines. Find the value of the angle marked y.



A. 130°
B. 115°
C. 65°
D. 60°

24. Kofi is 2 years older than Ama. If the sum of their ages is 16, find Ama's age.
A. 7 years.
B. 9years.
C. 14 years.
D. 18years.

25. Simplify $\sqrt{12} - \sqrt{27}$.
A. $2\sqrt{3} - 3\sqrt{3}$
B. $\sqrt{3}$
C. $-\sqrt{3}$
D. $2\sqrt{3} + 3\sqrt{3}$

26. Which of the following is arranged in ascending order?
A. $-25, -64, 4, 17.$
B. $-64, -25, 4, 17.$
C. $-64, -25, 17, 4$
D. $17, 4, -25, -64$

27. Solve $4^x = 32$.
A. $2\frac{1}{2}$
B. $3\frac{1}{2}$
C. 5
D. 7

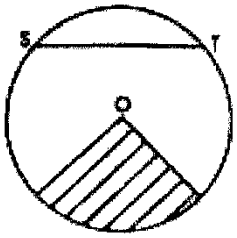
28. Correct 0.00025 to one significant figure.
A. 0.2
B. 0.003
C. 0.0002
D. 0.0003

29. Evaluate $\frac{37}{100} \times \frac{7}{10}$.
A. 0.259
B. 2.590
C. 25.900
D. 259.000

30. Given that $1:3 = x:21$, find the value of x.
A. 4
B. 5
C. 7
D. 63

31. A car used 8 hours to travel from town A to town B at a speed of 18km/h. Find the distance it covered.
A. 22.5km
B. 135km
C. 140km
D. 144km

The diagram below shows a circle with centre **O**. **S** and **T** are points on the circle. *Use it to answer questions* ***32*** *and* ***33*****.**



32. What name is given to the shaded region?
A. Sector.
B. Segment.
C. Arc
D. Radii

33. The line ST is called
A. an arc.
B. a chord.
C. a diameter.
D. a radius.

Study the triangle of odd numbers and use it to answer questions ***34*** *and* ***35.***

13 b c 19

7 9 a

3 5

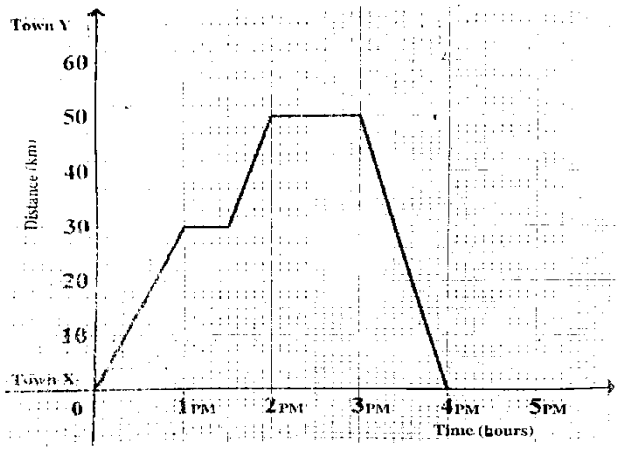
1

34. Evaluate $13 + b + c + 19$.
A. 62
B. 64
C. 74
D. 76

35. Evaluate $a + b + c$.
A. 24
B. 29
C. 36
D. 43

*Use the graph below to answer questions **36** to **38***

The travel graph describes the journey of a cyclist from Town **X** to Town **Y.**



36. What is the average speed for the return journey from Town Y to Town X?

A. $100kmh^{-1}$
B. $50kmh^{-1}$
C. $33.33kmh^{-1}$
D. $25kmh^{-1}$

37. State the period within which he travelled to Town **Y** after his first rest.

A. $1{:}00pm - 2{:}00pm$
B. $1{:}00pm - 4{:}00pm$
C. $1{:}15pm - 1{:}30pm$
D. $1{:}30pm - 2{:}00pm$

38. How many minutes did the cyclist spend at Town **Y?**

A. 15 minutes.
B. 20 minutes
C. 60 minutes.
D. 45minutes.

39. Simplify: $\binom{-2}{3} + \binom{-1}{5}$.

A. $\binom{-3}{-2}$
B. $\binom{-1}{2}$
C. $\binom{-3}{8}$
D. $\binom{-1}{-2}$

40. The point $P(5, 4)$ is reflected in the $y - axis$. Find the image.

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

END OF PAPER