EDUCATION-NEWS CONSULT
NOV. 2023 BECE HOME MOCK 1

(2024 BECE)
MATHEMATICS 1 & 2

2 HRS

Name……

Index Number……

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EDUCATION-NEWS CONSULT MOCK – NOV 2023 EDITION FOR 2024 BECE

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SPECIAL PERFORMANCE BOOSTER – MOCK 1

NOVEMBER 2023 MATHEMATICS 2 HOURS

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.*

1ST MOCK EXAMINATION, 2023/2024

MATHEMATICS 1 HOUR

PAPER 2 - [60 MARKS]

Answer four questions only. All questions carry equal marks.

All working must be clearly shown. Marks will be not be awarded for correct answer without corresponding working

1. (a) Simplify $\frac{2}{3}\ of\ 6\frac{3}{4} \div \left(2\frac{4}{15} - 1\frac{2}{3}\right)$

   (b) Find the equation of the straight line passing through the points with the coordinates A (-1, 5) and B (5, -1).

   (c) Given that $x = 2$, simplify, then substitute the value to evaluate the following expression $\frac{3}{x+1} - \frac{3}{x-1}$

2. (a) Abiba was given a discount of 15% of the price of a laptop selling for GH₵ 3,000. How much did she pay for the laptop?

   (b) Solve for the truth set of $\frac{3}{4}(x+1) + 1 \leq \frac{1}{2}(x-2) + 5$

   (c) If A (1, -2) and B (4, 2), find the magnitude of AB

3. (a) The marks obtained by some candidates in an examination are

   28 35 41 47 62 70 81

   59 60 61 62 70 80 68

   67 68 69 70 78 57 66

   74 76 77 78 54 64 73

   88 90 94 51 64 72 83

   (i) Construct a grouped frequency table for the distribution using the intervals 20 – 29, 30 – 39, 40 – 49 etc

   (ii) What is the probability that a candidate chosen at random had 50 to 69 marks?

   (b) Find the area of a semi-circle whose radius is 42 cm. (Take $\pi = \frac{22}{7}$)

   (c) A ladder is 10 m long. The foot of the ladder is 6 m away from the base of a wall. How far up is the wall?

4. (a) Solve $345.12 - 154.18$ using partitioning and place value system.

   (b) The vector $\boldsymbol{p} = \begin{pmatrix} -2 \\ -3 \end{pmatrix}$, $\boldsymbol{q} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ and $\boldsymbol{r} = \frac{1}{2}(\boldsymbol{q} + \boldsymbol{p})$, find the vector $\boldsymbol{r}$

   (c) Use a pair of compasses and a ruler only, perform geometric construction of
   (i) triangle ABC such that $|AB| = 8cm, angle\ CBA = 45^{\circ}\ and\ angle\ CAB = 60^{\circ}$
   (ii) the bisector of angle ACB to meet $|AB|$ at T
   (iii)Measure angle CTB

5. (a) Agogo standing at appoint P on a school soccer field, moved 25 steps due east to a point Q and then moved 15 steps due south to a point R. Illustrate the movement of Agogo with a diagram.

   (b) In an examination, every student took English or Mathematics or both. Out of 400 candidates, 60% took English while 78% took Mathematics.
   (i) Illustrate the information on a venn diagram
   (ii) How many candidates took both subjects?

   (c) Simplify $\frac{0.084 \times 0.81}{0.027 \times 0.04}$ leaving your answer in standard form.

6. (a) (i) Using a scale of 2cm to 1 unit on both axes, draw the points A(1, 3), B(3, 2) and C(2, 1)
   (ii)Draw on the same graph sheet the image $A_1B_1C_1$of ABC under clockwise rotation of 90˚ about the origin where $A \rightarrow A_1$, $B \rightarrow B_1$ and $C \rightarrow C_1$
   (iii)Draw also on the same graph the image $A_2B_2C_2$ of ABC under anticlockwise rotation of 180˚ about the origin where $A \rightarrow A_2$, $B \rightarrow B_2$ and $C \rightarrow C_2$

   (b) If **M**=**N**, find the value of x and y given that **M**= $\begin{pmatrix} x-2 \\ x-y \end{pmatrix}$ and **N**= $\begin{pmatrix} 1 \\ 2x-1 \end{pmatrix}$

PAPER 1

OBJECTIVE TEST

Answer all questions

Each question is followed by four options lettered A to D. Find out 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

1. Which of the following is a prime number?
   A. 12
   B. 17
   C. 15
   D. 24

2. Which number is the successor of 3621?
   A. 3620
   B. 3622
   C. 3621
   D. 3623

3. Which number comes next in the skip counting pattern 5, 10, 15, ……, 25?
   A. 20
   B. 22
   C. 24
   D. 18

4. In a survey, 80 students like football, 60 like basketball and 30 like both sports. How many students were surveyed in total?
   A. 90
   B. 110
   C. 170
   D. 120

5. Which equation represents the statement "Twice a number decreased by 8 is equal to14"?
   A. $2x + 8 = 14$
   B. $2x - 8 = 14$
   C. $2x - 14 = 8$
   D. $2x + 14 = 8$

6. Which of the following shapes has no parallel sides?
   A. Square
   B. Rectangle
   C. Rhombus
   D. Trapezium

7. Find the gradient of the line which passes through the points A(3, -2) and B(-3, 4)
   A. 1
   B. -4
   C. 8
   D. -1

8. Expand $-x(3 - 2x)$
   A. $-2x^2 - 3x$
   B. $2x^2 - 3x$
   C. $-2x^2 + 3x$
   D. $2x^2 - 3x$

9. Find the product of $4xy^4 \; and \; x^4yz$
   A. $4x^3y^4z$
   B. $4x^5y^5z$
   C. $4x^2y^4z$
   D. $4x^3y^4$

10. Subtract $(7x - 3)$ from $(5 - 3x)$
    A. $10x - 8$
    B. $4x - 8$
    C. $8 - 10x$
    D. $2 - 10x$

11. Evaluate $\frac{2}{3}(27 - 12) - 6$
    A. 4
    B. 6
    C. 14
    D. 16

12. T he ratio of the ages of two sisters is 4:3. The elder sister is 3 years older than the younger one. How old is the younger sister?
    A. 9 years
    B. 12 years
    C. 15 years
    D. 18 years

13. Simplify $\begin{pmatrix}2\\-3\end{pmatrix}-\begin{pmatrix}-1\\-5\end{pmatrix}$

A. $\begin{pmatrix}-3\\5\end{pmatrix}$

B. $\begin{pmatrix}3\\-8\end{pmatrix}$

C. $\begin{pmatrix}3\\2\end{pmatrix}$

D. $\begin{pmatrix}3\\8\end{pmatrix}$

14. Which of the following best describes the statement; "*The locus of a point which moves so that the distance from two fixed points is always equal*"?
    A. Bisecting of an angle
    B. Perpendicular bisector
    C. Circle
    D. Two parallel lines
15. A box contains 24 marbles, 10 of which are blue and the rest are green. A boy picks a marble at random from the bag. What is the probability that he picks a green marble?
    A. $\frac{1}{14}$

    B. $\frac{1}{17}$

    C. $\frac{5}{12}$

    D. $\frac{7}{12}$

16. Solve $5-2x>x+2$
    A. $x<1$
    B. $x>1$
    C. $x<3$
    D. $x>-3$

17. Given that $\boldsymbol{a}=\begin{pmatrix}-2\\3\end{pmatrix}$, $\boldsymbol{b}=\begin{pmatrix}2\\-5\end{pmatrix}$, find $\boldsymbol{a}+\boldsymbol{2b}$
    A. $\begin{pmatrix}2\\-7\end{pmatrix}$

    B. $\begin{pmatrix}2\\13\end{pmatrix}$

    C. $\begin{pmatrix}0\\-2\end{pmatrix}$

    D. $\begin{pmatrix}6\\13\end{pmatrix}$

18. Find the image of $T(5,-2)$ under the mapping $\begin{pmatrix}x\\y\end{pmatrix}\rightarrow\begin{pmatrix}2y+x\\x-2y\end{pmatrix}$
    A. (-1, 2)
    B. (1, 9)
    C. (8, 1)
    D. (9, 1)

19. What is the probability of obtaining a prime number when a fair die is thrown?
    A. $\frac{2}{3}$

    B. $\frac{1}{2}$

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

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

20. The diagonal of a rectangle is 5m long. If the length of the rectangle is 4m, find its width.
    A. 3m
    B. 4m
    C. 5m
    D. 9m

21. Simplify $\frac{12x^2yz}{39y^2z^2}$

    A. $\frac{x^2}{y^2}$

    B. $\frac{4x^2}{13yz}$

    C. $\frac{x^2}{y^2z^2}$

    D. $\frac{4x^2}{13y^2z^2}$

22. Factorize completely $1-16x^2$
    A. $(1-4y)(4-4y)$
    B. $(1+4y)(4+4y)$
    C. $(1+4y)(1-4y)$
    D. $(1-4y)(4y-1)$

23. In a right-angled triangle, if the length of the two shorter sides are 3cm and 4cm, what is the length of the hypotenuse?
    A. 5cm
    B. 6cm
    C. 7cm
    D. 8cm

24. Find the circumference of a circle with radius 3.5cm. Take $\left(Take\ \pi = \frac{22}{7}\right)$
    A. 11cm
    B. 22cm
    C. 35cm
    D. 38.5cm

25. A car is travelling at 40 km per hour. How far does it travel in $2\frac{1}{2}$ hours?
    A. 16 km
    B. 80 km
    C. 90 km
    D. 100 km

26. The sum of integer and 7 more than the next is 66. Find the integer.
    A. 73
    B. 29
    C. 59
    D. 50

27. If two parallel lines are cut by a transversal, the interior angles on the same side of the transversal are
    A. Congruent
    B. Vertical
    C. Complementary
    D. Supplementary

28. What is the value of 6 in 95.683?
    A. Ones
    B. Tens
    C. Tenths
    D. Thousand

29. If $x + 6 = -6$, find the value of $\frac{x}{4}$
    A. 3
    B. -3
    C. $\frac{3}{2}$
    D. $-\frac{3}{2}$

30. A school has 400 pupils of whom 160 are girls. What is the ratio of boys to girls?
    A. 2:5
    B. 3:2
    C. 5:2
    D. 8:5

31. Given that $2^{n^2} = 16$, find the value of n
    A. 2
    B. 3
    C. 4
    D. 5

32. Simplify $13 - (13 - 5) + 16$
    A. 6
    B. 21
    C. -11
    D. -14

33. Evaluate $0.369 \div 0.0369$
    A. 0.100
    B. 0.10
    C. 100
    D. 10.0

34. Write two hundred and two million, two thousand and two in figures
    A. 202,002,002
    B. 202,020,202
    C. 202,022,202
    D. 202,200,202

35. What is the expanded form of 786?
    A. 700 + 80 + 6
    B. 7000 + 800 +60
    C. 600 + 80 + 6
    D. 700 + 80 + 60

36. Which of the following is a composite number?
    A. 1
    B. 2
    C. 3
    D. 4

37. Which of the following numbers is a perfect square?

A. 15
B. 35
C. 39
D. 49

38. The area of a square is $49cm^2$. Find the perimeter of the square.
    A. 7cm
    B. 14cm
    C. 28cm
    D. 49cm

39. The longest chord of circle is the
    A. Circumference
    B. Diameter
    C. Sector
    D. Segment

40. Find the image F' of the point $F(-3,2)$ when it is rotated 180˚ anticlockwise about the origin.
    A. $(-2,3)$
    B. $(-3,-2)$
    C. $(-3,\ 2)$
    D. $(3,-2)$