BECE BOOSTER
MATHEMATICS
Essay and Objective
2 hours

2&1

Name: ……

Index number: ……

B.E.C.E PERFORMANCE BOOSTER

BASIC EDUCATION CERTIFICATE MOCK

MATHEMATICS

2 hours

[100 marks]

*Write your **name** and **index number** in **ink** in the spaces provided above*

This booklet consists of two papers. Paper 2 and paper 1. Answer four questions in paper 2.

Answer paper 2 on the question paper.

Paper 2 will last 1 hour after which the answer booklet will be collected

Answer paper 1 on your objective test answer sheet

Do not start paper 1 until you are told to do so. Paper 1 will last 1 hour

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PAPER 2: 1 HOUR (60 MARKS)

Answer four questions only

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

1. (a) Evaluate $\left(3\frac{1}{2}+\frac{1}{4}-\frac{1}{8}\right)\div 2\frac{1}{4}$

   (b) Amma spent $\frac{1}{4}$ of her pocket money on food, $\frac{1}{6}$ of the remaining money on sweets, $\frac{1}{5}$ of what still remained on classes. If she was still left with $GH¢10.50$, calculate her pocket money.

   (c) If $m=\begin{pmatrix}2x-3\\3-3y\end{pmatrix}$, $n=\begin{pmatrix}4-x\\y+2\end{pmatrix}$ and $m+2n=\begin{pmatrix}5\\4\end{pmatrix}$, find the values of x and y

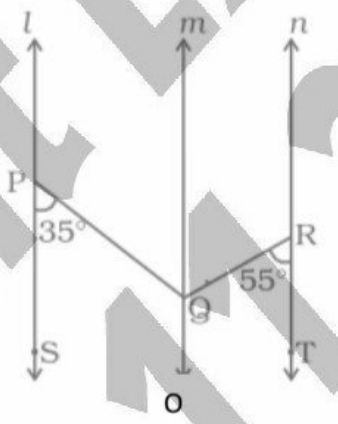
2. (a) Given that $S_n=\frac{n}{2}[a+(n-1)d]$

   i. find the value of S_n if $a=3, n=10$ *and* $d=2$

   ii. express d in terms of S_n, n *and* a

   (b) In the diagram below, lines LS, MO and NT are parallel lines ∠ QPS = 35° and ∠ QRT = 55°.

   Find ∠PQR



   (c) A shop owner allowed a discount of 10% on the price of an item. If the new price of the item is GH¢90.00. Find the original price of the item

3. (a) Factorize completely $4x^2-9x^2$

   (b) Using a ruler and a pair of compasses only, construct triangle XYZ, such that |XY| = 6cm | XZ| =8cm and | YZ| =10cm.

   i. Construct the mediator of line YZ

   ii. Construct the mediator of line XZ

   iii. Locate O the point of intersection of the mediators of lines YZ and XZ with centre O and radius OY, draw a circle

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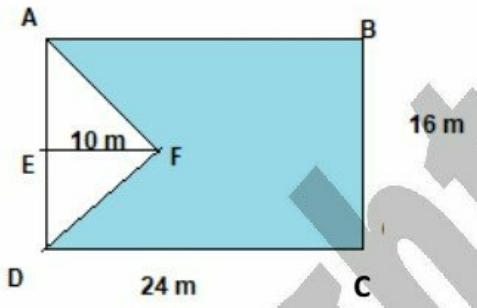
4. The table below shows school items at Kojokrom JHS bookshop.

School items	*Quantity*	*Price*
Pens	20	GH₵10.00
Books	30	GH₵9.00
School bags	15	GH₵30.00
School uniforms	18	GH₵20.00
Textbooks	35	GH₵4.00
Mathematical sets	4	GH₵5.00

a) Calculate the sales of each of the items, hence the total sales of all the school items at the bookshop.
b) Find the mean sales of the school items
c) Draw a pie chart to illustrate the sales of the school items at the bookshop
d) Find the percentage of Mathematical sets sales at the bookshop

5. (a) ABCD is a rectangle with dimensions 24m by 16m. AFE is a triangle such that EF = 10m. Calculate the area of the shaded portion.



(b) Solve for x in $\frac{2}{x} - 2 = \frac{3}{2x} + 3$

(c) In a class, 80 students speak either Twi or Gas. Forty percent of the class speak Twi, sixty percent speak Ga and ten percent of the class speak both Ga and Twi. Find the number of students who do not speak Twi nor Ga.

6(a) Kofi, Amma and Yaw received GH₵2700.00 to share in the ratio 2:3:x. if Yaw had GH₵900.00

i. Find the value of x
ii. Find the share of Kofi and Amma

(b) A man took a loan of GH₵24000 from a bank at $2\frac{1}{2}\%$ per annum for 5 years.

i. Calculate the total amount he will pay to the bank the end of the 5 years
ii. Find his yearly installment

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PAPER 1 (OBJECTIVES) 40 MARKS; 1 HOUR

1) If U ={x, y, z} and v ={z, y, x}.
What is the relationship between U and V?
   A. U and V are equal sets
   B. U and V are disjoint set
   C. U and V are Union sets
   D. U and V are intersection set
2) A set with three members will have how many subsets?
   A. 6
   B. 8
   C. 10
   D. 4
3) Write 225 as a product of prime factors
   A. $5^2 \times 3^2$
   B. 5x2
   C. $5^2 x 2^2$
   D. 5^3
4) Simplify $(5m + 3n) - (2m - n)$
   A. $5m - 4n$
   B. $3m + 4n$
   C. $3m - 2n$
   D. $7m + 4n$
5) The sum of 5 and x divided by 4 is equal to 3.5. find the value of x
   A. 8
   B. 9
   C. 2 ¼
   D. $3\frac{4}{13}$
6) The ratio of mangoes to oranges in a basket is 3:2. If there are 36 mangoes, how many oranges are there in the basket?
   A. 90
   B. 60
   C. 24
   D. 12
7) Express 0.125 as fraction in its lowest term
   A. $\frac{1}{8}$
   B. $\frac{1}{9}$
   C. $\frac{1}{12}$
   D. $\frac{1}{16}$
8) Convert 29.5439 into 2 significant figure
   A. 30
   B. 31
   C. 29
   D. 62
9) Find the HCF of 3^3x5^2 and 3^2x5^4
   A. $3^2 \times 5^2$
   B. $3^3 \times 5$
   C. $3. \times 5^2$
   D. $3^2 \times 5^3$

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10) Find the area of a square whose perimeter is 28cm

A. $784cm^2$
B. $196cm^2$
C. $49cm^2$
D. $14cm^2$

11) Simplify $\frac{1}{3}[\frac{1}{2}-\frac{1}{3}]-\frac{1}{3}[\frac{1}{3}-\frac{1}{2}]$

A. $-\frac{1}{9}$
B. $-\frac{1}{18}$
C. $\frac{1}{18}$
D. $\frac{1}{9}$

12) If $R=\frac{h}{2}+\frac{d^2}{8h}$. find R when $d=8$ and $h=6$

A. $3\frac{1}{6}$
B. $4\frac{1}{3}$
C. $4\frac{3}{4}$
D. $4\frac{9}{16}$

13) The gradient of straight the line that passes through points A(3,2) and B(4,8) is---

A. $-\frac{1}{16}$
B. $-\frac{1}{2}$.
C. 2
D. 6

14) A car is travelling at 60km per hour. How far does it travel in $2\frac{1}{2}$hours?

A. 30km
B. 60km
C. 120km
D. 150km

15. A box contains 30 identical balls of which 16 are red and the rest yellow. If a girl picks a ball at random from the box, what is the probability that it is a yellow ball?

A. $\frac{1}{16}$.
B. $\frac{7}{15}$.
C. $\frac{8}{15}$.
D. $\frac{7}{8}$.

16. Simplify $\frac{3x}{4}-\frac{x-y}{3}$

A. $\frac{5x-4y}{12}$.
B. $\frac{13x-4y}{12}$
C. $\frac{5x+4y}{12}$
D. $\frac{13x+4y}{12}$

17. Find the volume of a cylinder of height 3cm and radius 2cm

A. $6\pi cm^3$
B. $12\pi cm^3$
C. $18\pi cm^3$
D. $24\pi cm^3$

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18. Given that r=$\begin{pmatrix}-3\\4\end{pmatrix}$ and s=$\begin{pmatrix}1\\-3\end{pmatrix}$. Find $r - 2s$

A. $\begin{pmatrix}-5\\1\end{pmatrix}$.

B. $\begin{pmatrix}-5\\10\end{pmatrix}$

C. $\begin{pmatrix}-2\\10\end{pmatrix}$

D. $\begin{pmatrix}-1\\10\end{pmatrix}$

19. Which of the following fractions is equivalent to $\frac{3}{5}$

A. $\frac{21}{30}$

B. $\frac{12}{20}$

C. $\frac{15}{45}$

D. $\frac{6}{15}$

20. Calculate the simple interest on GH¢ 450.00 for 2 years at 12%

A. Gh¢ 191.00

B. Gh¢ 108.00

C. Gh¢ 54.00

D. Gh¢ 27.00

21. If x =5 and $2x + y = 8$. Find $x + y$

A. -5

B. 6

C. 3

D. 10

22. The opposite and adjacent of a right angle triangle are 5cm and 12cm respectively. Find the length of the diagonals

A. 13cm

B. 6cm

C. 8cm

D. 15cm

23. If vector $\overrightarrow{AB}$= $\begin{pmatrix}3\\4\end{pmatrix}$. What is vector $\overrightarrow{BA}$

A. $\begin{pmatrix}3\\4\end{pmatrix}$.

B. $\begin{pmatrix}-3\\-4\end{pmatrix}$

C. $\begin{pmatrix}4\\-3\end{pmatrix}$

D. $\begin{pmatrix}4\\6\end{pmatrix}$

24. The image of A(x, y) is A_1(-2, -4). Find the coordinate of A under rotation through 180° about the origin

A. A(2, 4)

B. A(2, -4)

C. A(-2, 4)

D. A(3, 4)

25. Simplify $6p^3xp^2 \div 3p^4$

A. 2p

B. 3p

C. 18p

D. $2p^2$

26. Given that $y = ax + 5$, find the relation when $x = 1, y = 0$

A. $Y = -5x + 5.$

B. $Y = x + 5$

C. $Y = 5x + 5.$

D. $Y = 2x + 4.$

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27. Amina spent $\frac{17}{35}$ of her pocket money on transport and food. If she spent $\frac{2}{7}$ on transport only, what fraction does she spend on food?

A. ¼.

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

C. $\frac{5}{7}$.

D. $\frac{15}{28}$

28. If $x \rightarrow 3x - 4$, what is the image of -2?

A. -10
B. -2
C. -1
D. 2

29. The ratio$9: x$ is equivalent to$36: 20$. What is the value of x?

A. 4
B. 5
C. 6
D. 8

30. If $a * b = 2a - b$, evaluate $4 * 3$

A. 1
B. 2
C. 4
D. 5

31. It takes 15 men, 48 days to weed a plot of land. How many men can weed the same plot of land in 16 days, if they work at the same time?

A. 5
B. 18
C. 32
D. 45

32. Factorize $3r^2s - 9rs^2$

A. $rs(3r - 5)$.
B. $3rs(s - 3r)$.
C. $3rs(r - 3s)$.
D. $r^2s^2(3r - 3r)$.

33. If $4(m + 4) = 18$, find the value of m

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

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

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

D. $\frac{7}{2}$.

34. Kofi is n years now. How old will he be 10 years from now?

A. (10+n) years
B. (n+10) years
C. (n-10) years
D. (10-n) years

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35. Solve 3(x-3) +4 = 2x

A. -2
B. 3
C. 2
D. 5

36. Evaluate -3-(-5-5-2)

A. 9
B. 10
C. 11
D. 8

37. Which of the following describes the locus of points equidistant from two fixed points?

A. Bisection of angle
B. Construction of circle
C. Bisection of a line
D. construction of arc

38. A map is drawn to a scale 1:100,000. What will be the distance in kilometers is represented by 5cm on the map.

A. 0.5k m
B. 5km
C. 50km
D. 500km

39. The average salary of a family of five is GH₵500.00. Calculate the total salary of the family.

A. GH₵25000.00.
B. GH₵5000.00.
C. GH₵2500.00
D. GH₵500.00

40. A polygon of side 6. Fid the interior angle

A. 60°
B. 120°
C. 40 °
D. 30°

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