

1ST ASSIGNMENT
MARCH, 2020
MATHEMATICS 2 & 1
Essay and Objective
2hours

2 & 1

Name

Index Number

ADDITROM SCHOOL

Basic Education Certificate Education

March, 2020

MATHEMATICS 2 & 1

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. Answer Paper 2 which comes first, in your answer booklet and Paper 1 on your Objective Test answer sheet. Paper 2 will last 1 hour after which the answer booklet will be collected. Do **not** start Paper 1 until you are told to do so. Paper 1 will last 1 hour.

2
Paper 2
Essay

1 hour

Answer **four** questions **only**. All questions carry equal marks.

The use of calculators is **not** allowed.

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

Answer all the questions in your answer booklet.

1. (a) Find the value of x such that $1001_{\text{two}} + 13x = 17_{\text{ten}}$.

(b) Three exterior angles of a pentagon are 51° , 87° and 100° . The remaining two exterior angles are equal. Find the size of each of the remaining angles.

(c) Three candidates K, L and M were voted into office as school prefects. K secured 45% of the votes, L had 33% of the votes and M had the rest of the votes. If M secured 1,430 votes, calculate,
(i) The total number of votes cast
(ii) How many more votes K received than L.
2. (a) Using a ruler and a pair of compasses only, construct
(i) $\triangle GBC$ with angle $GBC = 30^\circ$,
 $|BC| = 9.5\text{cm}$ and $|BG| = 12\text{cm}$,
(ii) a circle with C as centre and radius 6cm;
(iii) a perpendicular from C to BG.

(b) i. Locate A and D, the intersection of the circle and BG, such that A is on G.
(ii) Measure $|AD|$ and $\triangle ACD$.
(iii) What is the special name of the region between $|AC|$, $|CD|$ and the arc AD?
3. (a) Solve the equation $\frac{5-x}{3} + 2 = \frac{x-2}{2}$

(b) A cylinder has a diameter of 14cm and height 11cm.
(i) Find the circumference of the base.
(ii) Calculate the curved surface area of the cylinder [Take $\pi = \frac{22}{7}$].

(c) The median of five numbers is 15. The numbers are in the ratio 2: 4: 5: 7: 8 respectively.
(i) Calculate the sum of the five numbers.
(ii) Find the difference between the largest number and the smallest number.
4. (a) How many sides has a regular polygon whose interior angle is 156° ?

(b) A meat seller bought 250kg of meat for ₦224,000.00. At what price per kg should he retail it in order to make a profit of 25%?

(c) A man borrowed a sum of money from a bank at an interest rate of 12%. After 1 year he paid ₦896,000.00 to settle the loan and the interest. How much did he borrow from the bank?

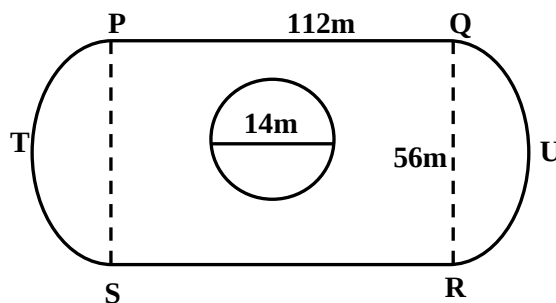
5. (a) A pie chart was drawn to represent the monthly car sales for the period January to June, 2003. The angles of six sectors of the pie chart are 50° , 54° , 73° , 70° , 59° , and 54° . The total number of cars sold during the given period was 511,200.

- (i) Calculate the number of cars sold in January.
- (ii) What was the highest number of cars sold during the period?
- (iii) What was the mean number of cars sold from January to June?

(b) Three blue balls, five green balls and a number of red balls are put together in a sack. One ball is picked at random from the sack. If the probability of picking a blue ball is $\frac{1}{6}$, find,

- (i) The number of red balls in the sack;
- (ii) The probability of picking a green ball.

6. The diagram below represents a field with a circular pond of diameter 14m. PTS and QUR are semicircles. PQRS is a rectangle with $|PQ| = 112\text{m}$ and $|QR| = 56\text{m}$.



Find

- (a) The distance round the field.
 - (b) The area of the field excluding the pond.
- [Take $\pi = \frac{22}{7}$].

END OF ESSAY TEST

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DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

YOU WILL BE PENALIZED SEVERELY IF YOU ARE FOUND LOOKING AT THE NEXT PAGE BEFORE YOU ARE TOLD TO DO SO.

**PAPER 1
OBJECTIVE TEST**

1hour

1. Use 2B pencil throughout.
2. on the pre-printed answer sheet, check that the following details are **correctly** printed:
Your **surname** followed by your **other names**, the *Subject Name*, your *Index Number*, *Centre Number* and the *Paper Code*.
3. In the boxes marked *Candidate Number*, *Centre Number* and *Paper Code*, **reshade** each of the shaded spaces.
4. An example is given below. This is a candidate whose name is Ben Kobby ISSAH.
His *index number* is 772384188 and he is writing the examination at *Centre Number* 77234.
He is offering *Mathematics 1* and the *Paper Code* is 0028.

**THE WEST AFRICAN EXAMINATIONS COUNCIL, GHANA
BASIC EDUCATION CERTIFICATE EXAMINATION
OBJECTIVE ANSWER SHEET**

CANDIDATE NAME:										SUBJECT NAME:										
1. Use HB Pencil Press firmly 2. Answer each question by choosing one letter and then, Shade through the letter chosen like this [A] [B] [C] [D] [E] 3. If you want to change an answer, rub out										first mark completely. 4. If only four alternative answers are given for each question, ignore the letter E. 5. Your question paper may have fewer than 60 questions.										
CANDIDATE NUMBER										CENTRE NUMBER					PAPER CODE					For Supervisor only if candidate is absent shade this space
[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]		
[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]		
[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]		
[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]		
[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]		
[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]	[5]		
[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]		
[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]		
[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]		
[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]	[9]		

Answer **all** the 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 space which bears the same letter as the option you have chosen. Give only **one** answer to **each** question. An example is given below.

If $3n + 2 = 8$, Find the value of n .

- A. 10
- B. 6
- C. 3
- D. 2

The correct answer is 2, which is lettered D and therefore answer space D would be shaded.

[A]

[B]

[C]

[D]

Think carefully before you shade the answer space; erase completely any answers you wish to change.

Do all rough work on this question paper.

Now answer the following questions.

OBJECTIVES

1. If $X = \{2, 3\}$, which of the following represents all the possible subsets of X ?

- A. $\{2, 3\}$
- B. $\{ \}$
- C. $\{2\}, \{3\}, \{2, 3\}$
- D. $\{ \}, \{2\}, \{3\}, \{2, 3\}$

2. If $P = \{\text{perfect squares less than } 100\}$ and $Q = \{\text{odd numbers}\}$, find $P \cap Q$.

- A. $\{9, 25, 49, 81, 100\}$
- B. $\{4, 16, 36, 64\}$
- C. $\{1, 9, 25, 49, 81\}$
- D. $\{9, 25, 49, 81\}$

3. What is the Highest Common Factor of 23, 43 and 74?

- A. 1
- B. 23
- C. 43
- D. 74

4. Write 8.1×10^3 as a decimal numeral.

- A. 0.0081
- B. 0.081
- C. 810
- D. 8100

5. Evaluate $2a - b(a + b)$, when $a = -3$ and $b = 4$.

- A. -10
- B. -22
- C. 10
- D. 22

6. Solve for x in the equation $\sqrt{5x} = 25$.

- A. 5
- B. 25
- C. 125
- D. 625

7. Which base five numeral is equivalent to $(4 \times 5^3) + (0 \times 5^2) + (2 \times 5^1) + (2 \times 5^0)$ base ten?

- A. 402_{five}
- B. 422_{five}
- C. 4022_{five}
- D. 4220_{five}

8. What must be multiplied by 1.5 to give 2.25?

- A. 15
- B. 1.5
- C. 3.375
- D. 3.75

9. Solve $\frac{x}{3} - \frac{4}{21} = \frac{x}{7}$

- A. 4
- B. 3
- C. 2
- D. 1

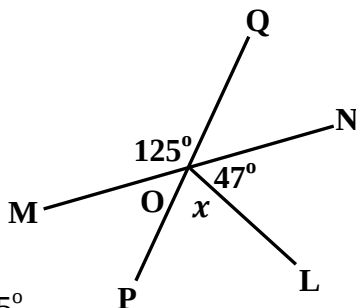
10. Amina spent $\frac{1}{3}$ of her pocket money on sweets and $\frac{3}{5}$ of the remainder on cosmetics. What fraction of her money was left?

- A. $\frac{7}{15}$
- B. $\frac{1}{15}$
- C. $\frac{4}{15}$
- D. $\frac{11}{15}$

11. A bank gives ₦20,000.00 in exchange for \$2.56. How much in cedis will be given in exchange for \$10.50?

- A. ₦51,200.00
- B. ₦62,031.25
- C. ₦82,031.25
- D. ₦210,000.00

12. The lines MN, PQ and LO meet at O. What is the size of the angle marked x ?



- A. 55°
- B. 78°
- C. 125°
- D. 133°

13. Simplify $1\frac{1}{2} - \frac{1}{4}$

$$\begin{array}{r} 1\frac{1}{2} - \frac{1}{4} \\ \hline 1\frac{1}{2} + \frac{1}{4} \end{array}$$

A. $\frac{4}{7}$

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

C. 1

D. 0

14. Simplify $4x^2 - (3x^2 - 2x^2 - 6)$

- A. $x^2 + 2$
- B. $-x^2 - 6$
- C. $3(x^2 + 2)$
- D. $2(x^2 + 3)$

15. The table below shows the weight distribution of an experimental group.

Use this table for questions 15 to 17.

Weight in kg	3.5	4	4.5	5	5.5
Frequency	2	5	8	4	1

15. Find the modal weight.

- A. 4kg
- B. 4.5kg
- C. 5kg
- D. 5.5kg

16. What is the total number of the group?

- A. 5
- B. 10
- C. 15
- D. 20

17. Calculate the mean weight correct to one decimal place.

- A. 402kg
- B. 4.3kg
- C. 4.4kg
- D. 4.5kg

18. An integer is selected at random from the set $Q = \{6 < x < 15\}$. What is the probability that x has two digits?

- A. $\frac{3}{8}$
- B. $\frac{2}{5}$
- C. $\frac{3}{5}$

D. $\frac{5}{8}$

19. A shop reduced all its prices by 10%. How much did a man pay for an article previously sold at ₦1220.00?

- A. ₦122.00
- B. ₦1,098.00
- C. ₦1,102.00
- D. ₦1,342.00

20. A car travels 450km in 6hours. How far can it travel in 4 hours with the same speed?

- A. 675km
- B. 426km
- C. 300km
- D. 280km

21. Three people shared ₦540,000.00 in the ratio 2:3:4. Find the least amount received.

- A. ₦60,000.00
- B. ₦120,000.00
- C. ₦180,000.00
- D. ₦240,000.00

22. Fulera bought T oranges at 7p each. How much change did she get from one cedi?

- A. $(100 - T)p$
- B. $(100 - 7T)p$
- C. $(1 - T)p$
- D. $(1 - 7T)p$

23. Simplify $(x^2 \div x^4) \times x^2$.

- A. x^4
- B. x^6
- C. x^8
- D. 1

24. Express the sum of $\frac{27}{10}$, $\frac{3}{100}$ and $\frac{1}{1000}$ as a decimal fraction.

- A. 30.1
- B. 3.01
- C. 2.731
- D. 2.7031

25. Find the image of P (-4, -5) under the mapping

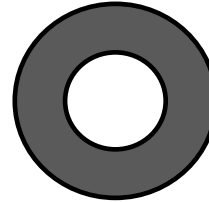
$$\begin{pmatrix} x \\ y \end{pmatrix} \rightarrow \begin{pmatrix} -y - x \\ x - y \end{pmatrix}$$

- A. (-9, 1)

- B. (-1, 1)
- C. (1, -1)
- D. (9, 1)

26. Find the area of the shaded portion, if the radius of the smaller circle is $3\frac{1}{2}$ cm and that of the larger

circle is 7cm.
[Take $\pi = \frac{22}{7}$]



- A. $115\frac{1}{2}\text{cm}^2$
- B. $112\frac{1}{7}\text{cm}^2$
- C. 154cm^2
- D. 77cm^2

27. If $a = \begin{bmatrix} 2 \\ 4 \end{bmatrix}$ and $b = \begin{bmatrix} -2 \\ 6 \end{bmatrix}$, find c such that

$$c = 2a + b.$$

- A. $\begin{bmatrix} 0 \\ 20 \end{bmatrix}$
- B. $\begin{bmatrix} 2 \\ 10 \end{bmatrix}$
- C. $\begin{bmatrix} 2 \\ 14 \end{bmatrix}$
- D. $\begin{bmatrix} 6 \\ 14 \end{bmatrix}$

28. Which of the following has its diagonals equal in length and bisect each other at right angles?

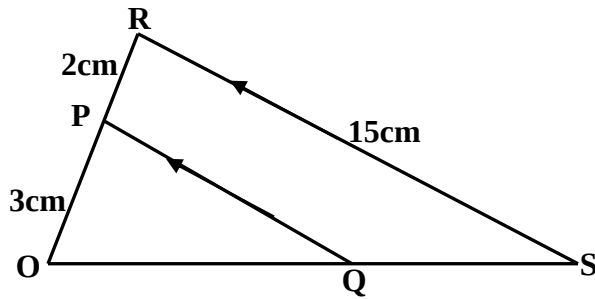
- A. Rhombus
- B. Kite
- C. Rectangle
- D. Square

29. For a regular 8-sided polygon, what is the ratio of the exterior angle to the interior angle?

- A. 1 : 2
- B. 1 : 3
- C. 1 : 4
- D. 1 : 5

The enlargement $\triangle OPQ \rightarrow \triangle ORS$ is illustrated in the diagram below.

Use it to answer Questions 30 to 32.



30. What is the scale factor of the enlargement?

- A. $\frac{2}{3}$
- B. $\frac{3}{5}$
- C. $\frac{13}{5}$
- D. $\frac{12}{3}$

31. Find PQ.

- A. 5cm
- B. 6cm
- C. 9cm
- D. 10cm

32. If the area of $\triangle OPQ$ is 27cm^2 , what is the area of $\triangle ORS$?

- A. 81cm^2
- B. 75cm^2
- C. 54cm^2
- D. 45cm^2

33. Which of these sets of numbers cannot be the lengths of the sides of a right-angled triangle?

- A. 9,16,25
- B. 7,24,25

- C. 3,4,5
- D. 8,15,17

34. A school presented 55 candidates for an examination and 11 of them failed. What percentage of the candidates passed?

- A. 20%
- B. 44%
- C. 25%
- D. 80%

35. Find the mean of the numbers 23, 25, 21 and 31.

- A. 23
- B. 24
- C. 25
- D. 26

36. Evaluate $(2\frac{1}{2})^2 - (1\frac{1}{2})^2$.

- A. 1
- B. 3
- C. 4
- D. 6

37. Solve $4 + 3x < 10$, if x is positive.

- A. $x < 2$
- B. $0 < x < 2$
- C. $0 < x < 4\frac{2}{3}$
- D. $0 < x < 2$

39. P (-2, 1) and Q (-1, 2) are two points. Find $\overrightarrow{PQ}$.

- A. $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$
- B. $\begin{pmatrix} -1 \\ 1 \end{pmatrix}$
- C. $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$
- D. $\begin{pmatrix} -1 \\ -1 \end{pmatrix}$

40. A point P moves in space such that it is always at a constant distance from a fixed point Q. What is the locus of P?

- A. a sphere with centre Q
- B. A circle with centre Q
- C. An arc of a circle
- D. A radius of a circle

END OF PAPER