SC 4022
WASSCE (SC) 2025
GENERAL MATHEMATICS/ MATHEMATICS [CORE] 2
$2\frac{1}{2}$ hours

2

Surname	Other Names
Taiwo	Emmanuel Oluwasegun
Centre Number	**Candidate's Number**

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE) for School Candidates, 2025

GENERAL MATHEMATICS/MATHEMATICS (CORE) 2

ESSAY

SC 2025 [100 marks] $2\frac{1}{2}$ hours

Do **not** *open this booklet until you are told to do so. While you are waiting, write your* **surname**, **other names**, **centre number** *and* **candidate's number** *in the spaces provided at the top of this booklet.*

Answer **ten** *questions in all.* **All** *the questions in* Section A *and* **five** *questions from* Section B.

Write boldly and legibly in **ink** *(blue or black) and state your answers precisely in the answer booklet provided.*

Do **not** *tear off any part of this booklet. It is an examination malpractice if you do so.*

SC4022SC25

SECTION A

[40 marks]

Answer **all** *the questions in this section.*

All *questions carry* **equal** *marks.*

1. Given that $\mu = \{x: 1 < x < 20$, where x is an integer$\}$, $P = \{x: x$ is a multiple of 3$\}$ and $Q = \{x: x$ is a prime number$\}$ where P and Q are subsets of μ, find:

(a) $P \cap Q'$;

(b) $P' \cup Q$;

(c) $(P \cup Q)'$.

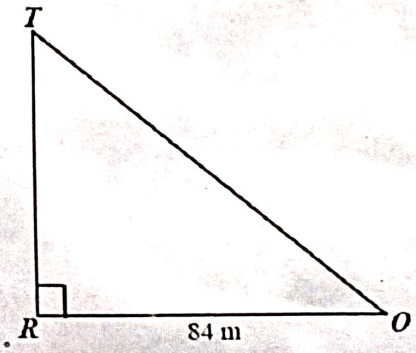
2. The product of the ages of Adu and Tanko is 9 **less than** Akorfa's age. If Tanko is 4 years older than Adu and Akorfa's age is **six times** Tanko's age, find Akorfa's age.

3. A company installs solar panels in its premises to reduce its electricity cost. The monthly savings on electricity in \$, is modelled by $S = 200 + 50x - 2x^2$, where x is the number of months after installation.

(a) At what time will the savings on electricity stop increasing?

(b) Find the **maximum** savings.

4.



NOT DRAWN TO SCALE

The diagram shows a tower TR and an observer at O. $|OR| = 84$ m and the angle of elevation of the top of the tower T from O is 57°.

(a) Calculate, correct to **three** significant figures, the height of the tower.

(b) The observer at O, moved away from the tower in the same straight line until the angle of elevation of T is 49°. Find, correct to **two** decimal places, how far the observer moved backwards.

5. The data represent the scores obtained by 9 applicants in an interview arranged in ascending order: $(3x + 2)$, 22, $(4x - 2)$, 23, 25, $(5x - 4)$, 29, 29 and $(x^2 - 7)$.

(a) Given that the range is 9, find the:

(i) value of x;

(ii) mean mark of the applicants.

(b) If **four** of the applicants who obtained the **highest** score were selected, determine the pass mark.

Candidate's Name:.....

SECTION B

| 60 marks |

Answer **five** *questions* **only** *from this section.*

All *questions carry* **equal** *marks.*

6. In a certain year, the consumption pattern of electricity charges in a town was as follows:
the cost of the **first** 30 units was $1.00 per unit;
the cost of the **next** 30 units was $7.00 per unit;
the cost of **each** additional unit was $5.00.

(a) If Amaka used 420 units of electricity in January that year, calculate the amount paid.

(b) If Amaka paid $2,740.00 in the month of February, calculate the number of units of electricity consumed.

(c) Find, correct to **two** decimal places, the percentage change in units of electricity consumed by Amaka in January and February.

7. Yaro drove from a town Gaja to Banga. After 2 *hours* in the journey, he observed that he had covered 80 *km* and realized that if he continued driving at same average speed, he would end up being late for 15 *minutes*. If he decided to increase the average speed by 10 *km h*, he would arrive at Banga 36 *minutes* earlier. Find the distance between Gaja and Banga.

8. *(a)* Using a ruler and a pair of compasses only, construct:

(i) a quadrilateral $PQRS$ such that $|PQ| = 8.5$ *cm*, $|QR| = 7.5$ *cm*, $\angle QPS = 60°$, $\angle PQR = 105°$ and S is a point on the locus, L_1, which is equidistant from $\overline{PQ}$ and $\overline{QR}$;

(ii) locus, L_2, of points equidistant from P and Q;

(iii) locate the point K, which is the point of intersection of L_1 and L_2.

(b) Measure $|KS|$.

9. *(a)* Mrs. Otoo spends $\frac{1}{9}$ of her monthly salary on rent, $\frac{1}{2}$ on food, $\frac{1}{4}$ on clothes and still had $195.00 left. How much does she earn in a month?

(b) A sector of a circle of radius 6 *cm* subtends an angle of 105° at the centre. Calculate the:

(i) perimeter;

(ii) area;

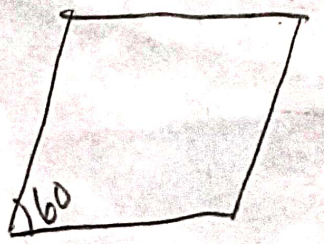
of the sector.

[Take $\pi = \frac{22}{7}$]

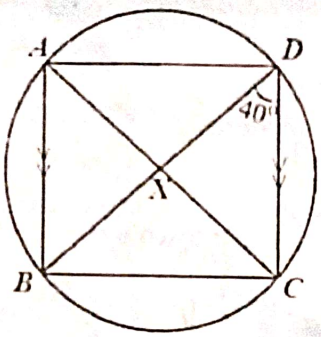
10. *(a)* The cost, C, of feeding some students in a class is partly constant and partly varies as the number of students, n, in the class. For 8 students, the cost is $70.00 and for 10 students the cost is $90.00. Find:

(i) an expression for C in terms of n;

(ii) the cost of feeding 12 students.



(b)



NOT DRAWN TO SCALE

In the diagram, A, B, C and D are points on a circle. $\overline{AB} \| \overline{DC}$, $\overline{AC}$ and $\overline{BD}$ intersect at X and $\angle BDC = 40°$. Find:

(i) $\angle ACD$;

(ii) $\angle AXD$.

11. (a) Given that $P = \begin{vmatrix} 2 & 4 \\ -9 & 1 \end{vmatrix}$ and $Q = \begin{vmatrix} 1 & -1 \\ 3 & -2 \end{vmatrix}$, find $PQ + 2Q$.

(b) A bag contains 8 red balls and some white balls, all of the same size. If the probability of drawing at random a white ball from the bag is **half** the probability of drawing a red ball, find the number of white balls in the bag.

12. (a) The **eighth** term of an Arithmetic Progression ($A.P$) is 46 and the sum of the **first** eight terms is 200. Find the:

(i) **first** term;

(ii) sum of the **first** 12 terms.

(b) The points $X(70°S, 60°E)$ and $Y(7°S, 60°E)$ lie on the surface of the earth.

(i) Illustrate the information in a diagram.

(ii) Find the distance between X and Y along the meridian.

[Take $\pi = \frac{22}{7}$ and $R = 6{,}400\ km$]

13. The following are the marks scored by 20 students in a test:

~~15~~	~~11~~	17	~~25~~	13	15	16	22	24	27
20	22	15	16	15	19	22	24	22	11

(a) Prepare a frequency table for the distribution using class intervals 10 - 12, 13 - 15, 16 - 18 ... .

(b) Calculate the variance of the distribution.

(c) If the pass mark for the test was 16, find the probability that a student selected at random from the class failed.