Candidate's Examination Number _____

CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)

CSSC JOINT EXAMINATIONS FOR CHURCH SCHOOLS

EASTERN ZONE

FORM II PRE – NATIONAL EXAMINATION 2024

ADDITIONAL MATHEMATICS

CODE: 042

Time: 2:30 Hours **Date: Friday, 30th August, 2024 p.m**

Instructions

1. This paper consists of **ten (10)** questions.
2. Answer **all** questions.
3. All necessary working and answer for each question must be shown clearly.
4. All answers must be written in the spaces provided.
5. All writings must be in black or blue ink.
6. Mathematical tables may be used.
7. Cellular phones and any unauthorized materials are not allowed in the Examination room.
8. Write your **Examination Number** on the top right hand corner of every page.

FOR EXAMINER'S USE ONLY

QUESTION NUMBER	SCORE	EXAMINER'S INITIALS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
CHECKER'S INITIALS		

1. (a) Check whether 1440 is divisible by 15.

(b) Determine the first 5 prime numbers of the Fibonacci sequence.

(c) Find the next four numbers of the following sequence 1, 4, 10, 22, …., …., …., …..,

2. (a) Give that $\frac{A}{b} = \sqrt{\left(\frac{f^2+p}{f^2-p}\right)}$ express f in temrs of A, b and p

(b) Given that $x^2 - y^2 = 27$ and $x + y = 9$, find the values of xy

3. (a) The sum of interior angles of a regular polygon is 1440°, determine:
   (i) The number of sides of the polygon

   (ii) The name of the polygon

   (iii) The maximum number of triangles that can be formed from the polygon.

   (b) The size of an interior angle of a regular polygon is one and a half times the exterior angle. Find the number of sides of the polygon.

4. (a) A point $p\ (x\ ,\ y)$ moves in such a way that its distance from the point $B\ (3,\ 4)$ is twice its distance from the lien $3x\ +\ 4y\ +\ 6\ =\ 0$. Find the locus of the point $p\ (x\ ,\ y)$.

(b) A point $p\ (x\ ,\ y)$ moves in such a way that its distance from the point $s\ (3\ ,\ 4)$ is equal to its distance from the point of intersection between the lines whose equation are $x - 2y = 4$ and $2x + 3y = 15$. Determine the locus of the point $p\ (x\ ,\ y)$

5. (a) Find the value of a, if the distance between the points $P\ (-\ 3,\ -\ 10)$ and $Q\ (a,\ -\ 5)$ is 5 units

(b) If the mid-point of the line segment joining the points $A\ (3,\ 4)$ and $B\ (k,\ 6)$ is $P\ (x,\ y)$ and $x + y - 10 = 0$, find the value of k

6. (a) State the order of rotational symmetry for each of the following polygons.

(i) Circle

_____

(ii) Equilateral triangle

_____

(iii) Rectangle

_____

(iv) Square

_____

(b) State the number of line(s) of symmetry for each of the following.

(i) 

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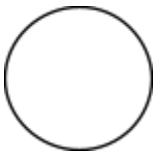
(ii) 

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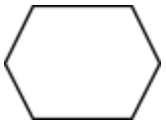
(iii) 

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7. (a) Construct a truth table for each of the following propositions.

(i) $(\sim p \Lambda (p \rightarrow q)) \rightarrow \sim q$

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(ii) $\left[\sim\left(P \vee Q\right) \vee \left(\sim P \wedge Q\right)\right] \vee P$

(b) "Maize grow well whenever, there is no rain. If the maize does not grow well, there is famine. But there is no famine. Therefore, there is rain". Test the validity of the statement.

8. (a) Quantity x is jointly proportional to quantity y and he reciprocal of quantity z. If $x = 3$ when $y = 3$ and $z = 2$;

(i) Write down the equation connecting $x,\ y\ and\ z$

(ii) Determine the value of z, when $x = 6\ and\ y = 20$

(b) Nine men working 8 hours a day can weed a field in 15 days. How many more hours a day must 27 men work in order to weed the same field in 5 days?

9. Draw the graphs of $y = x^2 - 7x + 18$ and $y = x + 2$ for $-1 \leq x \leq 6$ on the same xy-plane in the graph. Hence use the obtained graph to find the common solution of the given equations.

10. If set A has elements which are multiple of 6 and are less than 500 and set B has odd elements which are multiple of 7 and are also less than 500. Find the number of elements of $A \cup B$.