MATHEMATICS

1. **GENERAL COMMENTS**

The standard of the paper compares favourably with those of previous years. All questions were within the syllabus.

No significant improvement in current performance of candidates on that of previous years was observed generally.

2. **SUMMARY OF CANDIDATES' STRENGTHS**

The following are some of the strengths of candidates as stated by the Chief Examiner and Zonal Team Leaders:

(1) Drawing bar charts with correct identification and correctly labelled axes.

(2) Solving inequality involving mixed number.

(3) Reversal of inequality sign by dividing through by a negative number.

(4) Construction of 90^o and 45^o.

(5) Knowledge of definition of the mean and its application.

3. **SUMMARY OF CANDIDATES' WEAKNESSES**

The following were some of the weaknesses identified in candidates' work:

(1) Poor arithmetic computation (without use of calculators).
(2) Inability to identify 'regions' described in a Venn Diagram and make appropriate entries.
(3) Non-payment of attention to details of questions e.g. required degree of accuracy and other instructions in questions (graphs).
(4) Poor knowledge and understanding of English Language suspected in unpopularity of questions written in prose.
(5) Failure to apply BODMAS correctly.
(6) Inability to read values correctly from graph.

4. SUGGESTED REMEDIES

(1) Drill in arithmetic computation to reinforce the application of BODMAS correctly.
(2) Intensify the teaching and learning of comprehension in English Language.

Question 1.

(a) **Fifty students in a class took an examination in French and Mathematics. If 14 of them passed French only, 23 passed in both French and Mathematics and 5 of them failed in both subjects, find**

(i) **the number of students who passed in French,**

(ii) **the probability of selecting a student who passed in Mathematics.**

(b) **Solve the inequality** $2x1\frac{1}{2} \geq 5x - 6.$

(a) Venn Diagram required to be drawn, described regions identified for corresponding data entries to be made and used for finding solutions.
Good attempt was made generally to illustrate given information in Venn diagram. Some candidates wrote down the relevant equation and solved it correctly. Others could not make correct entries in the Venn diagram and therefore could not solve the questions.

Some candidates could not draw the Venn diagram while others did not define the variables used in their solution. Instead of using the correct set notation to represent the number of elements in the universal set as n (U) = 50 some represented it wrongly as U(50).

Probability was correctly defined in symbols but wrong values were substituted by most candidates.

(b) Candidates were supposed to clear fractions in inequality, collect like terms and solve for the variable and reverse the inequality sign when dividing through by a negative number.

Very good attempt was made by candidates. Few, however, ignored the reversal of the inequality sign.

Question 2.

(a) **Convert** 444_{five} **to a base two numeral.**

(b) **A man had three GH¢50.00, seven GH¢20.00 and five GH¢10.00 notes in his pocket. If he bought a bicycle for GH¢150.00 and two mobile phones at GH¢80.00 each, how many GH¢20.00 and GH¢10.00 notes did he have left?**

(a) Convert given number in base five to base ten i.e. expressing the number in exponents of five and simplifying for the base ten equivalent which is to be divided continuously to get the required base two equivalent.

A good number of candidates followed through the steps correctly. Some could not relate the exponents of five to the place values correctly while others could not simplify correctly.

(b) Candidates were to calculate the total amounts in the man’s pocket, the amount spent and the amount left (i.e. the difference)and determine its equivalent in GH¢20.00 and GH¢10.00 notes.

Very unpopular with candidates. Very few candidates attempted this question and worked through correctly. Others made no sense of it.

(a) Using a ruler and a pair of compasses only,

(i) construct a triangle XYZ with length XY = 7 cm, length YZ = 5 cm and angle XYZ = 45^{o}.

(ii) Measure and write down the length of XZ.

(b) Given that the circumference of a circle is 44 cm, find

(i) the radius of the circle,

(ii) the area of the circle.

Take ® $= \frac{22}{7}$

(a) Most candidates drew the line segments XY or YZ, constructed and bisected 90^{o} at Y correctly. Few , however, constructed and bisected 90^{o} at X. Some used dots to locate Z or X instead of arc with centre X or Y respectively. Others could not complete the triangle. Measurement of the length of XZ was accurate for the completed triangles.

(b) Candidates were supposed to use the formula for circumference of a circle to form an equation for the given circumference and solve for the radius. They were to subsequently use the relevant formula of a circle and its radius determined earlier to calculate the area of the circle.

A good number of candidates knew and applied the correct formulae and worked through for the correct radius and area. Others used the formula for the area for that of the circumference and vice versa. Arithmetic errors were common.

Question 4

The table shows the distribution of marks of students in a class test.

Mark	**1**	**2**	**3**	**4**	**5**	**6**
Frequency	**5**	**6**	**5**	**4**	**4**	**2**

(a)

Using a graph sheet, draw a bar chart for the distribution.

(a) Calculate the mean mark of the distribution correct to the nearest whole number.

Most candidates drew the bar chart with correct scale and axes correctly labelled. Very few however drew histogram instead of bar chart.

Candidates generally showed knowledge of finding $\sum f, \sum fx$ and applied $\sum fx/f$ to find the mean. Errors were arithmetic.

Question 5.

(a) **Simplify 6** $\left(3\frac{5}{6} - 1\frac{1}{4}\right)$.

(b) **Copy and complete the magic square so that the sum of numbers in each row or column or diagonal is 18.**

	4	
7	**8**	

(c) **Find the sum of all the factors of 24.**

(d) **Given that *m* =-** $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$**, *n* =** $\begin{pmatrix} -1 \\ 2 \end{pmatrix}$ **and *r* =** $\begin{pmatrix} 18 \\ -6 \end{pmatrix}$**, find *m* + *n* + *r*.**

(a) Change mixed numbers in the given expression into improper fractions, express same with common denominator, remove the bracket and reduce the resulting expression to its lowest term.

Candidates worked through these steps reasonably well. Some, however, left the answer as improper fraction instead of mixed number. There were too many arithmetic errors.

(b) Copy and complete the given 3 x 3 magic square. Thequestion was popular and candidates. Performance was good.

(c) Identify factors of 24 and add them. Candidates generally showed clear knowledge of "factor" even though some could not get all the factors of 24.

(d) Substitute given vectors into the given expression and evaluate the resulting expression. Most candidates did the substitution correctly, maintained and added the respective components. Errors were arithmetic.

Question 6.

(a) Copy and complete the table for the relation y = 2x + 5.

x	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**
y	**-1**	**1**		**5**				**5**

(b) (i) Using a scale of 2 cm units on both axes, draw two perpendicular axes 0x and 0y on a graph sheet.
(ii) Mark the x-axis from - 6 to 10 and y-axis from - 6 to 14.
(iii) Using the table, plot all the points of the relation y = 2x + 5 on the graph.
(iv) Draw a straight line through the points.

(c) Use the graph to find

(i) y when x = 1.6,
(ii) x when y = 10.

(a) A good number of candidates copied and completed the table correctly. Some did not show any table and others showed only the calculation of the missing values.

(b) (i) (ii) Candidates drew the axes with the correct scale. Some however did not label the axes while others did wrong labelling. and non-conventional calibration.

(iii) (iv) Very few candidates plotted the points accurately. Others were careless in the plotting of the points. All candidates attempted drawing the straight line but those with accurate plotted points had the line through them.

(c) Few candidates attempted this question. Some were able to locate the lines x = 1.6 and y = 10, drew the relevant perpendicular lines and read the corresponding respective values. Candidates accuracy in reading from graph is less than desired.