Candidates' Performance

Paper 1

In this year, 44 943 candidates sat the examination. The mean score was 56 marks. Candidates generally performed better in Section A than in Section B.

Section A(1)

Question Number	Performance in General
1	Very good. About 80% of the candidates were able to simplify the given expression.
2	Very good. About 85% of the candidates were able to make x the subject of the given formula.
3	Very good. About 80% of the candidates were able to factorize the given expressions.
4 (a)	Very good. Most candidates were able to solve the given compound inequality.
(b)	Good. About 65% of the candidates were able to write down the least integer satisfying the given compound inequality.
5	Very good. Most candidates were able to find the value of the given expression. A small number of the candidates wrongly thought that $a:c=5:6$.
6	Very good. About 75% of the candidates were able to find the marked price of the calculator. A small number of candidates confused the marked price with the selling price of the calculator.
7 (a)	Very good. Over 80% of the candidates were able to find $\angle POQ$.
(b)	Good. About half of the candidates were able to conclude that P, O and R are collinear with reasonable explanation.
(c)	Good. Many candidates were able to find the perimeter of ΔPQR. Some candidates wrongly gave the area of ΔPQR as the answer.
8 (a)	Good. Many candidates were able to give a complete proof. Some candidates were not aware that AB is the common side of ΔABC and ΔBAD.
(b)	Very good. Most candidates were able to find the area of the pentagon $ABCED$.
9 (a)	Very good. About 80% of the candidates were able to find the value of k.
(b)	Very good. Most candidates were able to write down the mean, the mode and the median of the distribution. A small number of candidates wrongly thought that the mode of the distribution was 10.

Section A(2)

Question Number	Performance in General
10 (a)	Very good. About 85% of the candidates were able to find $g(x)$.
(b)	Good. Many candidates were able to find the range of values of k. Some candidates wrongly thought that the discriminant of the equation $h(x)=0$ was equal to zero.
11 (a)	Very good. Most candidates were able to use the mean of the distribution to find the values of a and b.
(b)	Good. About 65% of the candidates were able to write down the least possible range of the distribution.
(c)	Good. Many candidates were able to find the greatest possible inter-quartile range of the distribution. Some candidates wrongly gave the least possible inter-quartile range of the distribution as the answer.
12 (a)	Poor. Most candidates wrongly thought that OD was perpendicular to OC, and hence they were unable to express correctly the slope of OD in terms of m.
(b)	Poor. Most candidates wrongly thought that P was the mid-point of OM, and hence they were unable to find correctly the x-coordinate of P.
13 (a)	Good. Many candidates were able to find the volume of X. Some candidates confused the volume of a pyramid with the volume of a prism.
(b)	Fair. Many candidates found difficulty in calculating the total surface area of X, and hence they were unable to explain correctly why X and Z are not similar.
14 (a)	Good. Over 60% of the candidates were able to write down the value of p. Some candidates were not aware that $-10p=40$.
(b) (i)	Good. Many candidates were able to find the values of q and r. Some candidates overlooked that $F(-1)=-12$ and $F(2)=0$.
(ii)	Fair. Many candidates confused irrational roots with imaginary roots.

Section B

Question Number	Performance in General
15	Fair. Many candidates wrongly applied the properties of logarithm, and hence they were unable to express y in terms of x.
16 (a)	Very good. Most candidates were able to find the probability that exactly 1 white cup is drawn.
(b)	Good. Many candidates were able to find the probability that at most 3 red cups are drawn. Some candidates wrongly applied the concept of complementary events, and hence they were unable to find the required probability.
17 (a) (i)	Very good. Most candidates were able to describe the geometric relationship between Γ and QR. A small number of the candidates wrongly thought that Γ was the angle bisector of QR.
(ii)	Good. Many candidates were able to use the result of (a)(i) to find the equation of Γ.
(b) (i)	Fair. Many candidates were not aware that the centre of C is the point of intersection of Γ and the perpendicular bisector of RS, and hence they were unable to find the equation of C.
(ii)	Poor. Most candidates were not aware that GU is a diameter of the circumcircle of ΔUVW, and hence they were unable to conclude that the area of the circumcircle of ΔUVW is greater than 100.
18 (a) (i)	Good. Over half of the candidates were able to find the length of QS.
(ii)	Good. Many candidates were able to find $\angle RQS$. Some candidates confused $\angle RQS$ with $\angle QSR$.
(b) (i)	Fair. Many candidates wrongly thought that PR was perpendicular to the plane PQS, and hence they were unable to find the shortest distance from R to the plane PQS.
(ii)	Poor. Most candidates were not aware that the distance between P and X is at least the shortest distance from P to the plane QRS, and hence they were unable to conclude that the distance between P and X exceeds 8 cm.
19 (a)	Fair. Over half of the candidates were unable to use the method of completing the square to express the coordinates of P in terms of m and n.
(b)	Fair. Many candidates wrongly thought that transforming f(x) to $\mathrm{f}\left(\frac{x}{5}\right)+7$ represented the enlargement of 5 times of the original along the y-axis and the downward translation of 7 units.
(c) (i)	Poor. Most candidates were unable to express the coordinates of Q in terms of m and n, and hence they were unable to find the coordinates of P and Q.
(ii)	Poor. Most candidates were unable to find the coordinates of P and Q, and hence they were unable to explain correctly why it is possible that $PQRS$ is a rhombus.

General recommendations

Candidates should:

1. grasp fundamental mathematics topics like change of subject, factorization, ratios, percentages, inequalities and mensuration;
2. show all working and explain clearly how to get the conclusion;
3. have a better understanding of statistical terms and their applications;
4. develop a better spatial sense, such as distinguishing right-angled triangles from non-right-angled triangles in 3-D figures;
5. make use of the memory space in calculators for carrying more significant figures throughout the working in solving trigonometric problems; and
6. explore the relationship between different parts of a question.

Paper 2

In this year, 44 886 candidates sat the examination. The paper consisted of 45 multiple-choice items. The mean score was 27. Post-examination analysis revealed the following:

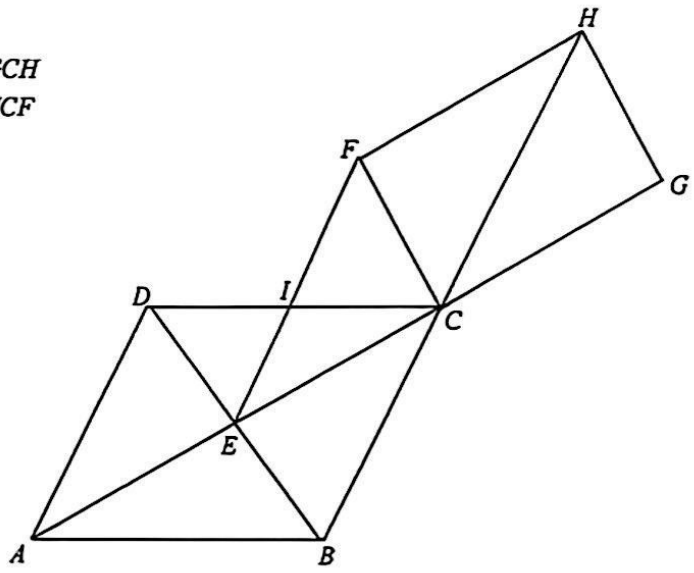
1. Candidates' performance on Items 1, 2, 3, 4, 5, 6, 12, 13, 18, 29 and 44 was good. Over 70% of the candidates answered them correctly.

2. Candidates' performance on Item 41 was unsatisfactory. Less than 30% of the candidates gave the correct answers.

3. In Item 21, many candidates were not aware that $\angle ABE$ and $\angle GCH$ are complementary angles. Many candidates wrongly thought that $\angle ABE = \angle GCH$, and hence wrongly gave Option D as the answer.

Q.21 In the figure, $ABCD$ is a rhombus. Denote the point of intersection of AC and BD by E. Let F be a point such that $BH // EF$ and $CFHG$ is a rectangle, where G and H are points lying on AC produced and BC produced respectively. Denote the point of intersection of CD and EF by I. Which of the following must be true?

I. $CI = FI$
II. $\angle ABE = \angle GCH$
III. $\Delta ADE \cong \Delta HCF$



A. I and II only (14%)
* B. I and III only (36%)
C. II and III only (23%)
D. I, II and III (27%)

4. In Item 25, many candidates wrongly thought that P was the mid-point of AB, and hence wrongly gave Option B as the answer.

Q.25 The coordinates of the points A and B are $(-3, 1)$ and $(-7, -5)$ respectively. If P is a point lying on the straight line $x - y + 13 = 0$ such that $AP = PB$, then the y-coordinate of P is

A. -11. (10%)
B. -2. (31%)
* C. 2. (40%)
D. 11. (19%)

5. In Item 35, many candidates were unable to find the correct value of a, and hence gave wrong answers.

Q.35 Let $z=(a-5)i+\frac{(a+2)i}{2+i}$. If a and z are real numbers, then $a-z=$

* A.	2.	(34%)
B.	3.	(17%)
C.	4.	(27%)
D.	5.	(22%)

6. In Item 37, many candidates confused the least value with the greatest value of $5x-2y+c$, and hence wrongly gave Option A as the answer.

Q.37 Consider the following system of inequalities:

$$\begin{cases} x-2y\le 1 \\ x+4y\le 13 \\ 2x-y\ge -1 \end{cases}$$

Let R be the region which represents the solution of the above system of inequalities. Find the constant c such that the least value of $5x-2y+c$ is 22, where (x, y) is a point lying in R.

A.	1	(23%)
B.	23	(19%)
* C.	25	(41%)
D.	29	(17%)

7. In Item 41, many candidates were not aware that I, J and P are collinear. Many candidates wrongly thought that J, J and Q were collinear, and hence wrongly gave Option D as the answer.

Q.41 Let G, H, I and J be the centroid, the orthocentre, the in-centre and the circumcentre of ΔPQR respectively. If $\angle PQR=\angle PRQ=22°$, which of the following are true?

I. G lies inside ΔPQR.

II. H lies outside ΔPQR.

III. I, J and Q are collinear.

* A.	I and II only	(27%)
B.	I and III only	(22%)
C.	II and III only	(22%)
D.	I, II and III	(29%)