Candidates' Performance

Module 1 (Calculus and Statistics)

Candidates generally performed better in Section A than in Section B.

Section A

Question Number	Performance in General
1 (a)	Very good. About 98% of the candidates were able to find the value of k by setting up a quadratic equation.
(b)	Very good. Over 90% of the candidates were able to find the value of $\mathrm{E}(X)$.
(c)	Very good. Most candidates were able to find the value of $\mathrm{Var}(2-3X)$.
2 (a)	Very good. Over 90% of the candidates were able to find the value of $\mathrm{P}(B\mid A)$ by using Bayes' Theorem.
(b)	Very good. Most candidates were able to conclude that A and B are not mutually exclusive events.
(c)	Very good. About 80% of the candidates were able to conclude that A and B are not independent events.
3 (a)	Very good. Most candidates were able to find the required mean μ and standard deviation σ.
(b)	Good. Some candidates mistook σ as the standard deviation of the sample mean.
4 (a)	Very good. Most candidates were able to write down a probability of geometric distribution but a few candidates wrongly wrote down $(0.6)^3(1-0.6)$ instead of $(1-0.6)^3(0.6)$.
(b)	Poor. Less than 10% of the candidates were able to set up the correct inequality $1-(1-0.6)^{10-k}>0.95$.
(c)	Good. Only some candidates were unable to find the expected amount of money correctly.
5 (a)	Very good. Most candidates were able to expand $(1+e^{3x})^2$.
(b)	Very good. Most candidates were able to find the coefficient of x^2.
6 (a)	Very good. Most candidates were able to find the values of m and n.
(b)	Very good. Many candidates were able to find the maximum value and the minimum value.
7 (a)	Good. Many candidates were able to find $\frac{dy}{dx}$ but some candidates did not simplify the answer.
(b)	Fair. Many candidates wrongly thought that $(9, 0)$ was the point of contact.

Question Number	Performance in General
8 (a)	Very good. Most candidates were able to use a correct substitution in finding $\int\left(\frac{1}{x}\ln\left(\frac{e}{x}\right)\right)\mathrm{d}x$.
(b) (i)	Very good. Many candidates were able to write down the x-intercept of Γ . However, some candidates wrongly gave $(e, 0)$ instead of e as the answer.
(ii)	Fair. Many candidates were unable to note that part of Γ lies above the x-axis while part of Γ lies below the x-axis.

Section B

Question Number	Performance in General
9 (a) (i)	Very good. Most candidates were able to find the confidence interval correctly.
(ii)	Very good. A few candidates wrongly used the sample mean obtained in (a)(i) to find the width of the interval concerned.
(b) (i)	Very good. About 80% of the candidates were able to find the required probability.
(ii)	Good. Many candidates were able to find the required conditional probability.
10 (a)	Very good. Over 85% of the candidates were able to write down all the five Poisson probabilities.
(b)	Very good. A few candidates were unable to use correct combinations in counting.
(c	Good. Some candidates wrongly multiplied the Poisson probability to the required probability.
(d)	Good. Only some candidates were unable to consider all the possible cases that cash coupons of total value $\$200$ are issued in a minute.
11 (a)	Very good. Most candidates were able to use correct sub-intervals when applying the trapezoidal rule to find an estimate of I .
(b)	Fair. Many candidates were unable to find $\frac{\mathrm{d}^2\mathrm{f}(t)}{\mathrm{d}t^2}$ correctly, hence they were unable to determine the nature of the estimate according to the suggestion of Ada in (a).
(c)	Poor. Most candidates did not prove that one of the estimates in (a) is an over-estimate while the other is an under-estimate, hence they were unable to finish the argument.
12 (a) (i)	Poor. Only a few candidates were able to express $(x-4)(x-1)$ in terms of λ, k and t .
(ii)	Poor. Only a few candidates were able to use the result in (a)(i) to finish the argument.
(b) (i)	Fair. Many candidates were unable to find $\frac{\mathrm{d}x}{\mathrm{d}t}$.
(ii) (1)	Fair. Only some candidates were able to find the value of k .
(2)	Fair. Many candidates estimated the number of crocodiles in the lake after a very long time without first determining that the crocodiles in the lake will not become extinct eventually.

General recommendations

Candidates are advised to:

1. have a better understanding of the properties of natural logarithms;
2. have more practice in counting involving combinations;
3. have more practice in solving equations involving radicals; and
4. have more practice in finding $\frac{d}{dt}a^{bt}$, where a and b are constants.