Candidates' performance

Module 1

Question			Performance in General
1.			Satisfactory. Many candidates set $\frac{dV}{dt}$ equal to 100 rather than -100.
2.	(a)		Good.
	(b)		Very poor. Most candidates failed to show clearly why $f'(x) > 0$.
3.	(a)		Very good.
	(b)	(i)	Excellent.
		(ii)	Satisfactory. Some candidates did not know $\int \frac{1}{x} dx = \ln\|x\| + C$, or wrote $\int \frac{1}{x^3} dx = -\frac{2}{x^2}$ or $\frac{1}{2x^2}$.
4.	(a)		Very good.
	(b)		Poor. Many candidates seemed to have no idea about how to solve the problem.
5.			Satisfactory. Some candidates substituted $t = 3$ and $x = 8$ to determine the value of the constant of integration.
6.	(a)		Excellent.
	(b)		Very good. Some candidates equated $\text{Var}(3 - 4X)$ to $3^2\text{Var}(X)$ or $3 - 4\text{Var}(X)$.
	(c)		Good.
7.	(a)		Excellent.
	(b)		Good. Few candidates wrote $P(A \cap B) = 0.1$ for (a) and then $P(A) \cdot P(B) = \cdots \neq 0.1 \neq P(A \cap B)$ for (b); while others tried to make conclusion by comparing $P(A \cap B)$ with 0, or $P(A \mid B)$ with $P(A) \cdot P(B)$.
8.	(a)		Very good.
	(b)		Poor. Most candidates did not understand the meanings of the conditional probabilities given.
	(c)		Fair. Many candidates used correct methods but obtained wrong answers, because their answers to (a) or (b) were wrong.
9.	(a)		Very good.
	(b)		Poor. Some candidates considered $P(X > 100)$ rather than $P(X > 100/n)$. Some candidates used wrong means such as 85 and $0.85n$, or wrong standard deviations such as $\frac{0.85(1-0.85)}{n}$, for standardisation. Others got inequalities in $\sqrt{n}$ with incorrect direction of sign.

10. (a) (i)	Excellent.
(ii)	Fair. Some candidates wrote nothing but only the expression provided in the question.
(b)	Fair. Some candidates failed to write the correct integral for the area. Some omitted details showing why $[-e^{-u}(1+u)]_0^{\ln 2} = \frac{1-\ln 2}{2}$.
(c) (i)	Satisfactory. Careless mistakes prevented some candidates from obtaining the correct answer.
(ii)	Very poor. Most candidates did not attempt this part.
11. (a)	Good. Some candidates thought that $\lim_{t\to+\infty} e^{-t} = 1$.
(b)	Fair. Quite a lot of candidates failed to consider both the value of y at $t=0$ and the limit found in (a).
(c)	Very poor. Most candidates wrote wrongly the equation required in (i).
12. (a)	Satisfactory. Some candidates found the value of $P(\mu - 1.75 \le X \le \mu + 1.75)$ instead of $P(\mu - 3.5 \le X \le \mu + 3.5)$.
(b)	Fair. Some candidates got inequalities in k with incorrect direction of sign.
(c) (i)	Good. Few candidates used the sample standard deviation in the calculation.
(ii)	Poor. Some candidates wrongly treated 21 as the mean of $\overline{Y}$. Some candidates thought that the length of the confidence interval was 3 .
13. (a)	Excellent. Some candidates missed the case of 3 delays in a day.
(b)	Good. Some candidates used incorrect expressions such as $1 - (1 - 0.2942)^3$ to find the required probability.
(c) (i)	Poor. Quite a number of candidates wrongly used $\frac{1}{\text{P(bad day)}}$ to find the required mean number.
(ii)	Satisfactory. Some candidates used C_2^7 instead of C_2^6 in the calculation.
(iii)	Very poor. Many candidates were able to write the related terms for the required probability, but assigned wrong coefficients to them.

General comments and recommendations

1. Generally speaking, candidates were rather weak in solving inequalities in probabilities.
2. Similar to previous years, some candidates wrote "In" for natural logarithm.