1. (a)	$\mathrm{P}(C') = \dfrac{\mathbf{103}}{\mathbf{120}}$ oe	**awrt 0.858**	B1 (1)
(b)	$\mathrm{P}(A \cap B \cap C') = \mathbf{0}$		B1 (1)
(c)	$\mathrm{P}(A \cup B \cup C') = \dfrac{9+3+2+5+1+93}{120}$ or $\mathrm{P}(A \cup B \cup C') = 1 - \dfrac{7}{120}$		M1
	$= \dfrac{\mathbf{113}}{\mathbf{120}}$ oe	**awrt 0.942**	A1 (2)
(d)	$\mathrm{P}(\text{At most 1}) = \mathrm{P}(0 \text{ or } 1) = \dfrac{93+9+7+1}{120}$ or $\dfrac{120-2-5-3}{120}$		M1
	$= \dfrac{\mathbf{110}}{\mathbf{120}}$ oe	**awrt 0.917**	A1 (2)
(e)	$\mathrm{P}(A \mid \text{At most 1}) = \dfrac{9/120}{"110/120"}$		M1
	$= \dfrac{\mathbf{9}}{\mathbf{110}}$ oe	**awrt 0.0818**	A1 (2)
(f)	$\left[\mathrm{P}(X=0) = \dfrac{93}{120}\right]$ $\mathrm{P}(X=1) = \dfrac{17}{120}$ $\mathrm{P}(X=2) = \dfrac{8}{120}$ $\mathrm{P}(X=3) = \dfrac{2}{120}$		M1
	$\mathrm{E}(X) = \left[\dfrac{93}{120} \times 0\right] + \dfrac{17}{120} \times 1 + \dfrac{8}{120} \times 2 + \dfrac{2}{120} \times 3$		M1
	$= \dfrac{\mathbf{13}}{\mathbf{40}}$ or **0.325** oe		A1 (3)
	Notes		**[11]**

(a) B1 (allow awrt 0.858)

(b) B1 cao condone 0/120 but do not allow other denominators

(c) M1 for either correct expression for $\mathrm{P}(A \cup B \cup C')$

A1 o.e. (allow awrt 0.942)

(d) M1 correct expression

A1 $\dfrac{11}{12}$ o.e. (allow awrt 0.917)

(e) M1 follow through their part (d) if num < denom eg $\dfrac{m/120}{"110/120"}$ or if the fraction in (d) has denominator of 120 $\dfrac{m}{"\text{their } 110"}$ where $0 < m <$ their 110 Allow $\dfrac{n}{120-3-2-5}$ or $\dfrac{n}{110}$ where $0 < n < 110$

A1 o.e. (allow awrt 0.0818)

(f) 1st M1 for the probability distribution of X (condone missing $\mathrm{P}(X=0)$) awrt 0.14 awrt 0.067 and awrt 0.017 May be implied by a correct expression for $\mathrm{E}(X)$. At least 2 correct must be associated with the correct x value

2nd M1 correct follow through expression for $\mathrm{E}(X)$ ft their probabilities and X values

A1 Dep on both previous method marks being awarded. **Working must be checked.**

A correct answer with no working scores 3/3

SC $\mathrm{P}(X=17) = 17/120$ (awrt 0.14) $\mathrm{P}(X=8) = 8/120$ (awrt 0.067) $\mathrm{P}(X=14) = 14/120$ (awrt 0.12) leading to awrt 4.58 or $183/40$ gains M0M1A0

Question Number	Scheme	Marks