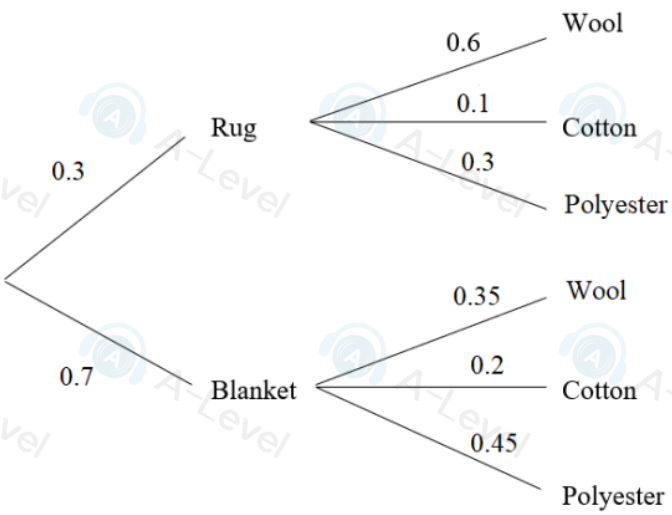
Question	Scheme	
1 (a)	0.85	B1
		(1)
(b)	$3X-3<X+2\rightarrow X<2.5$	M1
	$[P(X<2.5)=]$ 0.5	A1
		(2)
(c)	$[E(X)=]1\times0.3+2\times0.2+3\times0.35+4\times0.15=$	M1
	2.35	A1
		(2)
(d)	$\left[E\left(X^2\right)=\right]1^2\times0.3+2^2\times0.2+3^2\times0.35+4^2\times0.15[=6.65]$	M1
	$[\text{Var}(X)=]$"6.65"−"2.35"^{2}	M1
	$=1.1275$*	A1*
		(3)
(e)	$[\text{Var}(5-2X)=]4.51$	B1
		(1)

Question Number	Scheme	Marks
3(a)		B1 B1
		(2)
(b) (i)	$P(W')=0.3\times(0.1+0.3)+0.7\times(0.2+0.45)$ or $P(W')=1-(0.3\times0.6+0.7\times0.35)$ $=\underline{\mathbf{0.575}}$	M1 A1
		(2)
(ii)	$P(B\mid W')=\frac{P(B\cap W')}{P(W')}=\frac{0.7\times(0.2+0.45)}{'0.575'}$	M1
	$=\frac{91}{115}$	A1
		(2)

Question Number	Scheme	Marks
2.(a)	$[\mathrm{E}(X) =]\ (-2\times0.15)+(-1\times a)+0+(1\times a)+(3\times0.4)$ or $-0.3-a+a+1.2$ $= \underline{\mathbf{0.9}}$	M1 A1 (2)
(b)	$[\mathrm{E}(X^2) =]\{(-2)^2\times0.15\}+\{(-1)^2\times a\}+\{1^2\times a\}+\{3^2\times0.4\}$ or $0.6+2a+3.6$	M1
	So $4.2+2a=4.54$	dM1
	$a = \underline{\mathbf{0.17}}$	A1
	Use of sum of probabilities = 1 e.g. $0.15+$ "0.34" $+0.4+b=1$	M1
	$b = \underline{\mathbf{0.11}}$	A1
		(5)
(c)	$[\mathrm{Var}(X) =]\ 4.54-(\text{their } 0.9)^2\ \ [=3.73]$	M1
	$\mathrm{Var}(Y) = (-2)^2\mathrm{Var}(X)$	M1
	$= \underline{\mathbf{14.92}}$ (accept 14.9)	A1
		(3)
		[10 marks]

Question Number	Scheme	Marks
6(a)	$[10k=1\Rightarrow]k=0.1$	B1
		(1)
(b)	e.g. $\mathrm{P}(X=1)=0.1$ and $\mathrm{P}(X=2)[=\mathrm{F}(2)-\mathrm{F}(1)]=0.1$	B1
	e.g. $\mathrm{P}(X=3)[=\mathrm{F}(3)-\mathrm{F}(2)]=0.1$	M1
	X: 1 | 2 | 3 | 4 | 5 | 6 $\mathrm{P}(X=x)$: 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3	A1
		(3)
(c)	$a+a+a+b+b+b+0.11+0.05=1\ \ [3a+3b=0.84]$	M1
	$a+2a+3a+4b+5b+6b+0.77+0.4=4.02\ \ [\Rightarrow 6a+15b=2.85]$	M1
	e.g. $9a=1.35\Rightarrow a=0.15$*	A1*
		(3)
(d)	$b=0.13$	
	$\mathrm{E}(Y^2)=1^2\times0.15+2^2\times0.15+3^2\times0.15+4^2\times\text{'0.13'}+5^2\times\text{'0.13'}+6^2\times\text{'0.13'}$ $+7^2\times0.11+8^2\times0.05=[20.7]$*	M1 A1*
		(2)
(e)	$[\mathrm{Var}(Y)=]20.7-4.02^2[=4.5396]$	M1
	$\mathrm{Var}(5-2Y) = 4\mathrm{Var}(Y) = 4\times\text{'4.5396'} = 18.1584$ awrt 18.2	M1 A1
		(3)
(f)	$\text{'0.1'}\times0.15+\text{'0.1'}\times0.15=0.03$	M1 A1
		(2)
	Notes	**Total 14**