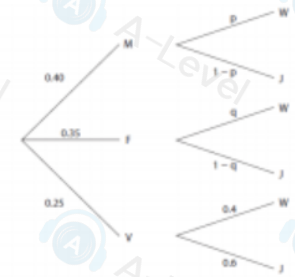
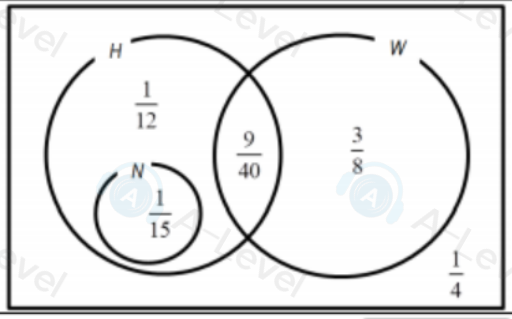
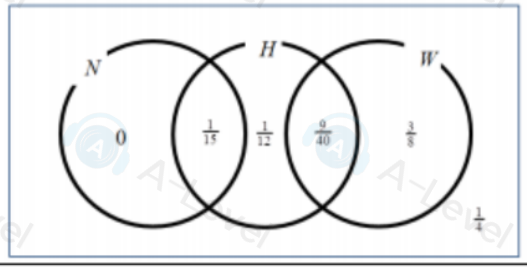
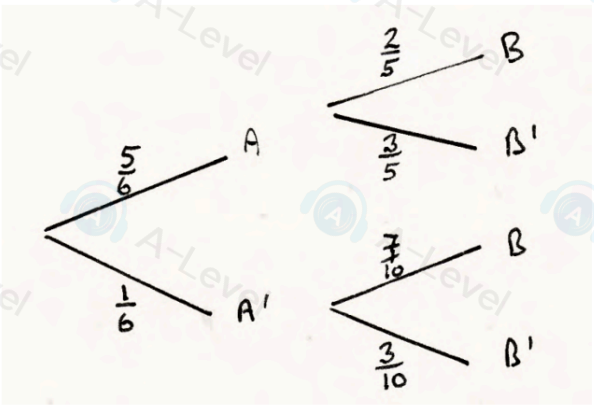
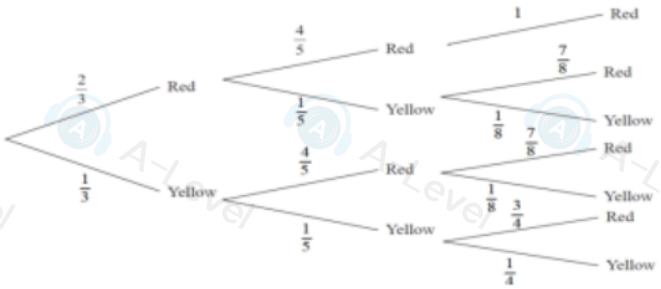
2. (a)		B1 B1 (2)
(b)	$P(W) = 0.4p + ($ [illegible] $5" \times 0.4$ $[= 0.4p + 0.35q + 0.1]$	B1ft (1)
(c)	Correct expression: $P(W \cap V) = "0.1" = "0.25" \times P(W)$ <u>or</u> $P(W) = P(W \mid V) = 0.4$ $0.1 = 0.25(0.4p + 0.35q + 0.25 \times 0.4)$ <u>or</u> $0.4p + 0.35q + 0.25 \times 0.4 = 0.4$	M1 A1 (2)
(d)	$\frac{7}{30} = \frac{0.35(1-q)}{"P(J)"}$ Since V and W are independent so are V and $W' = J$ so $P(J) = 0.6$ <u>or</u> sub $P(J) = 1 -$ their (b) to get an equation in p and q [May see $8p - 23q + 12 = 0$] [So $1 - q = \frac{2}{3}P(J)$ therefore] $\underline{\boldsymbol{q = 0.6}}$ $8p + 7 \times "0.6" = 6$ So $\underline{\boldsymbol{p = 0.225}}$ or $\frac{9}{40}$	M1 dM1 A1 ddM1 A1 (5)
(e)	$\{P(V \mid W) = P(V) = 0.25$ (since independent) and $P(M \mid W) = 0.225\ (= p)\}$ $P(F \mid W) = \frac{0.35 \times "0.6"}{"0.4"}$ <u>or</u> $\frac{0.35q}{(b)}$; $= \frac{21}{40}$ or 0.525 [Since this prob > 0.5 therefore it must be the largest] so conclusion <u>is</u> correct Allow B1ft for comparing 3 calculated probs of the form $P(M \cap W)$ needn't be correct ft	M1 ;A1 B1ft (3) **[13]**

A1 | awrt 144

Question Number	Scheme		Marks
4(a)	$P(H \cup W) = P(H) + P(W) - P(H \cap W)$	$P(H' \cap W) = P(H \cup W) - P(H)$	M1
	$P(H \cap W) = \frac{3}{8} \times P(W)$	$P(H' \cap W) = P(H') \times P(W)$	M1
	$\frac{3}{4} = \frac{3}{8} + P(W) - \frac{3}{8}P(W)$	$\frac{3}{8} = \frac{5}{8}P(W)$	A1
	$P(W) = \frac{3}{5}$*	$P(W) = \frac{3}{5}$*	A1cso*
			(4)
(b)	$P(N' \mid H) = \frac{\frac{3}{8} - \frac{1}{15}}{\frac{3}{8}}$ or $\frac{\frac{9}{40} + \frac{1}{12}}{\frac{3}{8}}$ or $1 - \frac{\frac{1}{15}}{\frac{3}{8}}$		M1
	$= \frac{37}{45}$ = awrt 0.822		A1
			(2)
(c)			B1 M1 M1 M1 A1 **(5)**
			Total 11

Question Number	Scheme	Marks
4. (a)	[Let P(A) = p]	
	$0.4p + 0.7(1-p) = 0.45$	M1A1
	$0.25 = 0.3p$	M1
	$p = \frac{5}{6}$	A1
		B1ft B1
		(6)
(b)	$[\mathrm{P}(A' \mid B')] = \frac{\frac{1}{6}\times 0.3}{0.55}$	M1
	$= \frac{1}{11}$	A1
		(2)
		[Total 8]

Question Number	Scheme	Marks
4. (a)		B1 B1 B1
		(3)
(b)	[Cases RYY or YRY or YYR] Prob $= \frac{2}{3}\times\frac{1}{5}\times\frac{1}{8} + \frac{1}{3}\times\frac{4}{5}\times\frac{1}{8} + \frac{1}{3}\times\frac{1}{5}\times\frac{6}{8}$	M1 A1ft
	$[= \frac{1}{120}(2+4+6)$ or $(0.0166...+0.033...+0.05)] = \frac{12}{120}$ or $\underline{\underline{\frac{1}{10}}}$ (*)	A1*cso
		(3)
(c)	[P($RYY \mid RYY$ or YRY or YYR) =] $\frac{"\frac{2}{3}\times\frac{1}{5}\times\frac{1}{8}"}{\frac{1}{10}}$	M1
	$= \underline{\underline{\frac{1}{6}}}$	A1
		(2)
(d)	x | 0 | 1 | 2 | 3 P($X=x$) | $\frac{64}{120}$ or $\frac{8}{15}$ | $\frac{42}{120}$ or $\frac{7}{20}$ | $\left[\frac{1}{10}\right]$ | $\frac{2}{120}$ or $\frac{1}{60}$	B1 M1 A1
		(3)
(e)	[E(X) =] $\frac{1}{120}(0 + "42" + "2\times 12" + "3\times 2")$	M1
	$= \frac{72}{120}$ or $\underline{0.6}$	A1
		(2)
		[13]