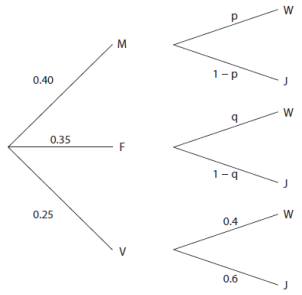
Question Number	Scheme	Marks
2. (a)		B1 B1 (2)
(b)	$P(W) = 0.4p + 0.35q + \text{“0.25”} \times 0.4$ [$= 0.4p + 0.35q + 0.1$]	B1ft (1)
(c)	Correct expression: $P(W \cap V) = \text{"0.1"} = \text{"0.25"} \times P(W)$ <u>or</u> $P(W) = P(W \mid V) = 0.4$ $0.1 = 0.25(0.4p + 0.35q + 0.25 \times 0.4)$ <u>or</u> $0.4p + 0.35q + 0.25 \times 0.4 = 0.4$	M1 A1 (2)
(d)	$\frac{7}{30} = \frac{0.35(1-q)}{\text{"P}(J)\text{"}}$ 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] ***<u>q = 0.6</u>*** $8p + 7 \times \text{"0.6"} = 6$ So ***<u>p = 0.225</u>*** or $\frac{9}{40}$	M1 dM1 A1 ddM1 A1 (5)
(e)	$\{P(V \mid W) = P(V) = 0.25$ (since independent) and $P(M \mid W) = 0.225$ ($= p$)$\}$ $P(F \mid W) = \frac{0.35 \times \text{"0.6"}}{\text{"0.4"}}$ <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]**

	Notes
(a)	1st B1 0.25 for $P(V)$ 2nd B1 for correct probabilities on 2nd branches $(1 - p)$, $(1 - q)$ [allow their values] and 0.6
(b)	B1ft for a correct expression using their values from tree diagram
(c)	M1 for sight or use of a correct expression in V and W or correct equation in p and q (ft their part (b)) A1 for a fully correct equation (needn't be simplified) [may see $0.4p + 0.35q = 0.3$ <u>or</u> $8p + 7q = 6$]
(d)	1st M1 for using given conditional probability to form an equation in q and $P(J)$ using $\frac{7}{30}$ 2nd dM1 (dep on 1st M1) for a getting $P(J) = 0.6$ <u>or</u> sub 1 – their (b) and get 2nd equation in p and q 1st A1 for $q = 0.6$ [NB must be $q = 0.6$ not just $P(J) = 0.6$] May see after 3rd M1 for solving with p 3rd ddM1(dep on both Ms) for seeing substitution of their 1st value to find the 2nd value (p or q) Allow ft of their p or q in one of their equations provided p and q both lie in (0, 1) 2nd A1 for $p = 0.225$ or exact equivalent After the 2nd M1, sight of $p = 0.225$ and $q = 0.6$ earns the final 3 marks
(e)	M1 for a method for finding $P(F \mid W)$ A1 for a correct value $\frac{21}{40}$ or exact equivalent B1ft for a correct conclusion based on enough probs found ft their probabilities