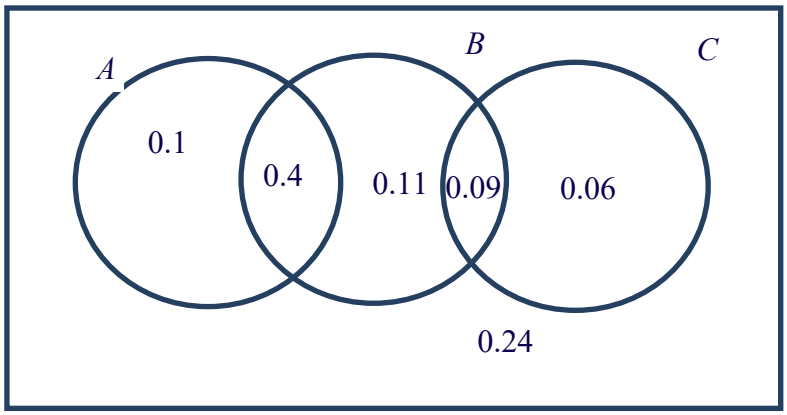
Question Number	Scheme	Marks
7(a)	$\mathrm{P}(A \cap B) = 0.4$	B1
	$\mathrm{P}(A \mid B) = \dfrac{0.4}{\mathrm{P}(B)}$	
	$\dfrac{0.4}{\mathrm{P}(B)} = \dfrac{2}{3}$	M1
	$\mathrm{P}(B) = 0.6$	A1
		(3)
(b)	$\mathrm{P}\left(A' \mid B'\right) = \dfrac{0.5 + 0.4 - 0.6}{0.4} = \dfrac{3}{4}$ or $\dfrac{"0.24" + "0.06"}{0.4} = \dfrac{3}{4}$	M1A1
		(2)
(c)	$\mathrm{P}(B \cap C) = 0.6 \times 0.15$	M1
	$= 0.09$	A1
		(2)
(d)		M1 M1 M1 A1ft A1
		(5)
		Total 12

Notes
Mark parts (a), (b), (c) and (d) together. If there is a contradiction between the Venn diagram and the relevant part then the answer stated in the relevant part takes precedence.

(a)

B1 $\mathrm{P}(A \cap B) = 0.4$ oe may be implied by further work. May be seen on the Venn diagram in (d)

M1 sets $\dfrac{\text{their } 0.4}{\mathrm{P}(B)} = \dfrac{2}{3}$ (must be numerical) May be implied by 0.6

A1 $\left[\mathrm{P}(B) =\right] 0.6$ oe (correct answer with no incorrect working seen 3/3)

(b) M1 May attempt e.g.

$$\frac{\mathrm{P}(A' \cap B')}{\mathrm{P}(B')} = \frac{\mathrm{P}(A') + \mathrm{P}(B') - \mathrm{P}\left(\left(A \cap B\right)'\right)}{\mathrm{P}(B')} = \frac{1 - \left(\mathrm{P}(A) + \mathrm{P}(B) - \mathrm{P}(A \cap B)\right)}{\mathrm{P}(B')}$$

OR $\dfrac{\mathrm{P}(C \cap B') + \mathrm{P}((A \cup B \cup C)'))}{\mathrm{P}(B')}$

Must see the values substituted in

e.g. $\dfrac{0.5 + \text{their } 0.4 - \text{their } 0.6}{1 - \text{their } 0.6}$ or $\dfrac{1 - (0.5 + \text{their } 0.6 - \text{their } 0.4)}{\text{their } (0.1 + 0.24 + 0.06)}$

or $\dfrac{\text{their } 0.24 + \text{their } 0.06}{\text{their } (0.1 + 0.24 + 0.06)}$

provided num<denom and both are probabilities

A1 $\frac{3}{4}$ oe (correct answer with no incorrect working seen scores 2/2)

(c) M1 their (a) × 0.15 (provided 0 < their (a) < 1) – may be implied by their 0.09. You may need to check this on your calculator.

A1 0.09 oe (correct answer with no incorrect working seen scores 2/2). Allow to be scored if seen on the Venn diagram in (d)

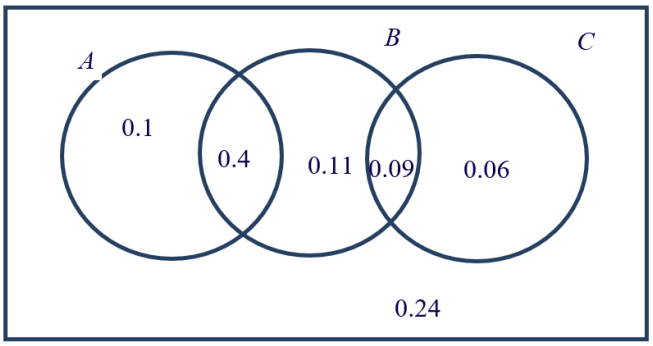
(d) M1 3 overlapping circles labelled A, B and C oe where P($A \cap C$)=0 See main scheme diagram. May appear in a different order. Condone two of the circles to be labelled implying the labelling of the third.
M0 if one circle lies entirely inside another or if one is entirely separate (usually C) Do not allow blanks as zeros.

M1 for the two sections of C look for $\mathrm{P}(B \cap C)$ = their 0.09 **and** $\mathrm{P}(C \cap B')$ = 0.15 – their 0.09 from (c) both non-zero

M1 for the two sections of A look for $\mathrm{P}(A \cap B)$ = their 0.4 from (a) and $\mathrm{P}(A \cap B')$ = 0.5 – their 0.4 from (a) both non-zero

A1ft **dep on all previous method marks.** For 0.24 or prob outside so that all 6 probs add to 1 or ft on their diagram

A1 all correct including a box and all three labels.



Note: No labels allow access to 2nd and 3rd M1 marks ONLY