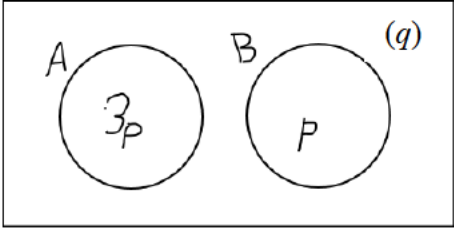


Question	Scheme	Marks	AOs
5(i)(a)	Box and 2 non-intersecting circles labelled $A$ and $B$	B1	2.1
			
(b)	$P(A) + P(B) \leq 1$ or $4p \leq 1$ oe $0 < P(B) \leq 0.25$	M1 A1	1.1b 1.1b
		<b>(3)</b>	
(ii)(a)	If independent $P(C D) = P(C)$ so $C$ and $D$ not independent	B1	2.4
		<b>(1)</b>	
(b)	Use of $P(C D) = \frac{P(C \cap D)}{P(D)}$	M1	1.1b
	$3 \times P(C) = \frac{0.5 \times P(C)}{P(D)}$	A1	2.1
	$P(D) = \frac{1}{6}$	A1	1.1b
	$P(C' \cap D') = \frac{7}{10}$ so $P(C \cup D) = \frac{3}{10}$	B1	1.1b
	Use of $P(C \cup D) = P(C) + P(D) - P(C \cap D)$	M1 dM1	3.1a 1.1b
	$\frac{3}{10} = P(D) + \frac{1}{6} - 0.5 \times P(C)$		
	$P(C) = \frac{4}{15}$	A1	1.1b
		<b>(7)</b>	
<b>(11 marks)</b>			

**Notes:**

(i) (a) B1 correct shape diagram with  $A$  and  $B$  labelled and  $p$  and  $3p$  correctly placed

(b) M1 correct idea for upper limit in words or inequality

A1 fully correct

(ii)(a) B1 needs not independent or **and** valid reason

(b) 1<sup>st</sup> M1 any attempt to use formula for  $P(C|D)$

1<sup>st</sup> A1 may be implied by sight of  $P(D) = \frac{1}{6}$

B1 alt award if correct region labelled with  $\frac{7}{10}$  in Venn diagram

2<sup>nd</sup> M1 use of formula with their  $P(C \cup D)$  and  $P(D)$

3<sup>rd</sup> dM1(dependent on previous M1) complete method to find  $P(C)$

3<sup>rd</sup> A1  $P(C) = \frac{4}{15}$  with valid supporting reasoning