

SAMPLE PAPER 5: PAPER 2

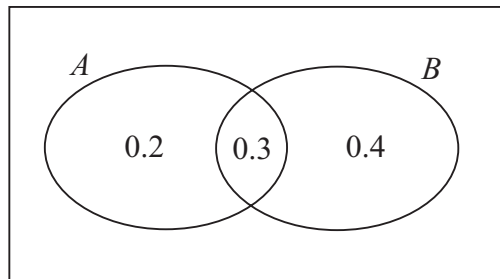
QUESTION 5 (25 MARKS)

Question 5 (a)

- (i) Two events are said to be independent if one event *does not affect* the outcome of the other.
- (ii) If A and B are independent events $P(A \cap B) = P(A) \times P(B)$
- (iii) If A and B are independent events $P(B|A) = P(B)$
- (iv) For all events $P(A \cap B) = P(A) \times P(B|A)$

Question 5 (b)

The events A and B are such that $P(A) = 0.5$, $P(B) = 0.7$ and $P(A \cap B) = 0.3$.



- (i)
$$\begin{aligned} P(A \cup B) &= P(A) + P(B) - P(A \cap B) \\ &= 0.7 + 0.5 - 0.3 \\ &= 0.9 \end{aligned}$$
- (ii)
$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.3}{0.7} = \frac{3}{7}$$
- (iii) The events are not independent.

$$P(A|B) \neq P(A)$$

$$\frac{3}{7} \neq 0.5$$
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