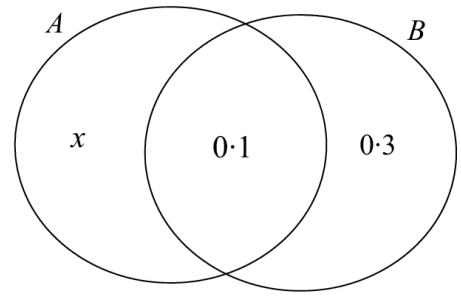## Question 1

(b) Two events, A and B, are represented in the diagram. $P(A \cap B) = 0{\cdot}1$, $P(B \setminus A) = 0{\cdot}3$ and $P(A \setminus B) = x$. Write $P(A)$ in terms of x and hence, or otherwise, find the value of x for which the events A and B are independent.
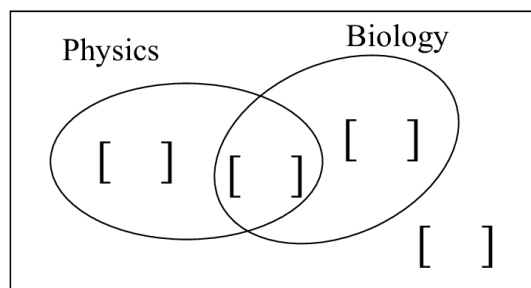
A B

x $0{\cdot}1$ $0{\cdot}3$

$P(A) =$

$x =$

Question 2

(b) In a class of 30 students, 20 study Physics, 6 study Biology and 4 study both Physics and Biology.

(i) Represent the information on the Venn Diagram.

A student is selected at random from this class. The events E and F are:

     E: The student studies Physics
     F: The student studies Biology.

Physics   Biology

[   ]   [   ]   [   ]

[   ]

(ii) By calculating probabilities, investigate if the events E and F are independent.

Question 1 **(25 marks)**

The events A and B are such that $P(A) = 0{\cdot}7$, $P(B) = 0{\cdot}5$ and $P(A \cap B) = 0{\cdot}3$.

(a) Find $P(A \cup B)$

(b) Find $P(A \mid B)$

(c) State whether A and B are independent events, and justify your answer.