If $P(B)=\frac{3}{4}, P(A\cap B\cap \bar{C})=\frac{1}{3}$ and *(2003S)*

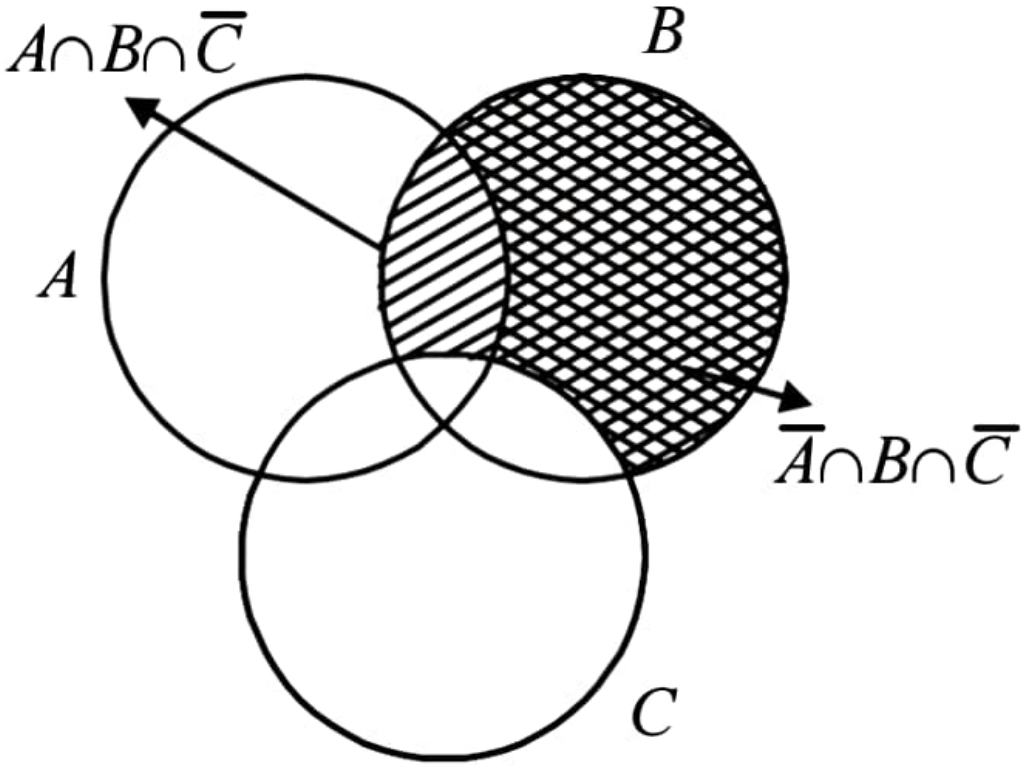
$P(\bar{A}\cap B\cap \bar{C})=\frac{1}{3}$, then $P(B\cap C)$ is

(a) 1/12 (b) 1/6 (c) 1/15 (d) 1/9

(a) Given that $P(B) = 3/4, P(A \cap B \cap \overline{C}) = 1/3$

$P(\overline{A} \cap B \cap \overline{C}) = 1/3$

From venn diagram, we see



$$B \cap C \equiv B - (A \cap B \cap \overline{C}) - (\overline{A} \cap B \cap \overline{C})$$

$$\Rightarrow P(B \cap C) = P(B) - P(A \cap B \cap \overline{C}) - P(\overline{A} \cap B \cap \overline{C})$$

$$\Rightarrow P(B \cap C) = \frac{3}{4} - \frac{1}{3} - \frac{1}{3} = \frac{9-4-4}{12} = \frac{1}{12}$$