Four persons independently solve a certain problem correctly with probabilities $\frac{1}{2}, \frac{3}{4}, \frac{1}{4}, \frac{1}{8}$. Then the probability that the problem is solved correctly by at least one of them is

A $\frac{235}{256}$

B $\frac{21}{256}$

C $\frac{3}{256}$

D $\frac{253}{256}$

Correct option is A)

$P(A) = 1/2 \Rightarrow P\left(\bar{A}\right) = 1/2$

$P(B) = 3/4 \Rightarrow P\left(\bar{B}\right) = 1/4$

$P(C) = 1/4 \Rightarrow P\left(\bar{C}\right) = 3/4$

$P(D) = 1/8 \Rightarrow P\left(\bar{D}\right) = 7/8$

P (at least one of them solves correctly) = 1 − P (none of them solves correctly)

$$= 1 - \left(\frac{1}{2} \times \frac{1}{4} \times \frac{3}{4} \times \frac{7}{8}\right) = \frac{235}{256}$$