25. Solution: B
Let $Y =$ positive test result
$D =$ disease is present (and $\sim D =$ not $D$)
Using Baye’s theorem:
\[
P[D|Y] = \frac{P[Y|D]P[D]}{P[Y|D]P[D] + P[Y|\sim D]P[\sim D]} = \frac{(0.95)(0.01)}{(0.95)(0.01) + (0.005)(0.99)} = 0.657.
\]

26. Solution: C
Let:
$S =$ Event of a smoker
$C =$ Event of a circulation problem
Then we are given that $P[C] = 0.25$ and $P[S|C] = 2P[S|C^c]$
Now applying Bayes’ Theorem, we find that
\[
P[C|S] = \frac{P[S|C]P[C]}{P[S|C]P[C] + P[S|C^c](P[C^c])}
= \frac{2P[S|C^c]P[C]}{2P[S|C^c]P[C] + P[S|C^c](1 - P[C])}
= \frac{2(0.25)}{2(0.25) + 0.75} = \frac{2}{2 + 3} = \frac{2}{5}.
\]

27. Solution: D
Use Baye’s Theorem with $A =$ the event of an accident in one of the years 1997, 1998 or 1999.
\[
= \frac{(0.05)(0.16)}{(0.05)(0.16) + (0.02)(0.18) + (0.03)(0.20)} = 0.45.
\]