6.A

A: test positive
B: have disease
$P(A|B) = 90\%$
$P(\overline{A}|\overline{B}) = 95\%$
$P(B) = 2\%$

6.B

$P(\overline{A}|\overline{B}) = 95\% \to P(A|\overline{B}) = 5\% \to P(A\overline{B})/P(\overline{B}) = 5\%$
$P(A\overline{B}) = 5\% \times 98\%$
$P(A|B) = P(AB)/P(B) = 90\% \to P(AB) = 90\% \times 2\%$
$P(A) = P(AB) + P(A\overline{B}) = 0.067$
$P(B|A) = \frac{P(AB)}{P(A)} = \frac{0.018}{0.067} \approx 26.87\%$
I use the law of total probability to solve this problem.

6.C

My answer says the chances a positive result is right is 26.87%.

Because the disease affects only 2% of the populationso even if the test is still very accurate to the people who are not affected. The number of people who are false positive is still considerable to the number of people who a true positive. So the rate of false positives is so high.

7.A

$P(A|3times\ positive) = P(A\&3times\ positive)/P(3times\ positive)$
$P(A\&3times\ positive) = P^3(AB) = 5.832 \times 10^{-6}$
$P(3times\ positive) = P^3(A) = 0.000300763 = 3.00763 \times 10^{-4}$
$P(A|3times\ positive) \approx 1.94\%$

7.B

Because with more times of test, the probability that all tests are false positive decrease, for example if the probability of false positive is a in one time(0¡a¡1),then the probability of false positive for all 3 times is a^3,$a^3 < a$.