

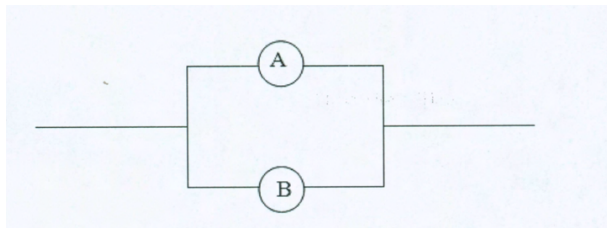
**Baye's Problem****Example 1**

- a) Fill in the table using the information below
- Suppose that a known disease occurs in 4% of the population
  - The medical test produces a positive reading on 99.1% of those infected with the disease
  - Suppose that this test gives a positive result in healthy patients 2% of the time
  - Assume we have 100,000 random individuals who follow the above information perfectly

	Has Disease	Does Not Have Disease	Total
Test Positive			
Test Negative			
Total			100,000

- b) Determine  $P(\text{Have the Disease} \mid \text{Tested Positive})$

- c) Determine  $P(\text{Have the Disease} \mid \text{Tested Negative})$

**Circuit Problems**

Determine the probability that the circuit works given that the component works probability is bellowed.

1.  $P(A) = 0.91$  ,  $P(B) = 0.98$

2.  $P(A) = 0.99$  ,  $P(B) = 0.84$

**Back to Risk...with some Basic Probability**

	Sick	Healthy	Total
Low Vitamin D Consumption	420	1,123	
Normal Vitamin D consumption	4,567	58,590	
Total	4,987	59,713	

1. Calculate the RR:

2. Calculate the AR:
3. Calculate the AR%:
4. Calculate the NNC:
5. P (Low Vitamin D Consumption  $\cup$  Healthy)
6. P (Normal Vitamin D Consumption  $\cap$  Sick)

### **Expected Value and Negative Test**

1. Suppose that the current positivity rate is 3.5%. That is, 3.5% of those that get tested actually test positive. If we decide to do batches of size 12, what is the probability that a batch of 12 independent individuals will produce a negative test.
2. Suppose that we are doing batch testing with batches of size 16. Suppose that the probability that a batch of size 16 tests negative is 0.835. Determine the expected number (expected value) of tests needed for a group of size 16.