TIE4203 Decision Analysis in Industrial & Operations Management
Solutions to Assignment #1

Question 1.

- 90 of the 100 known cases tested positive.
  True positive rate = 90/100 = 0.9

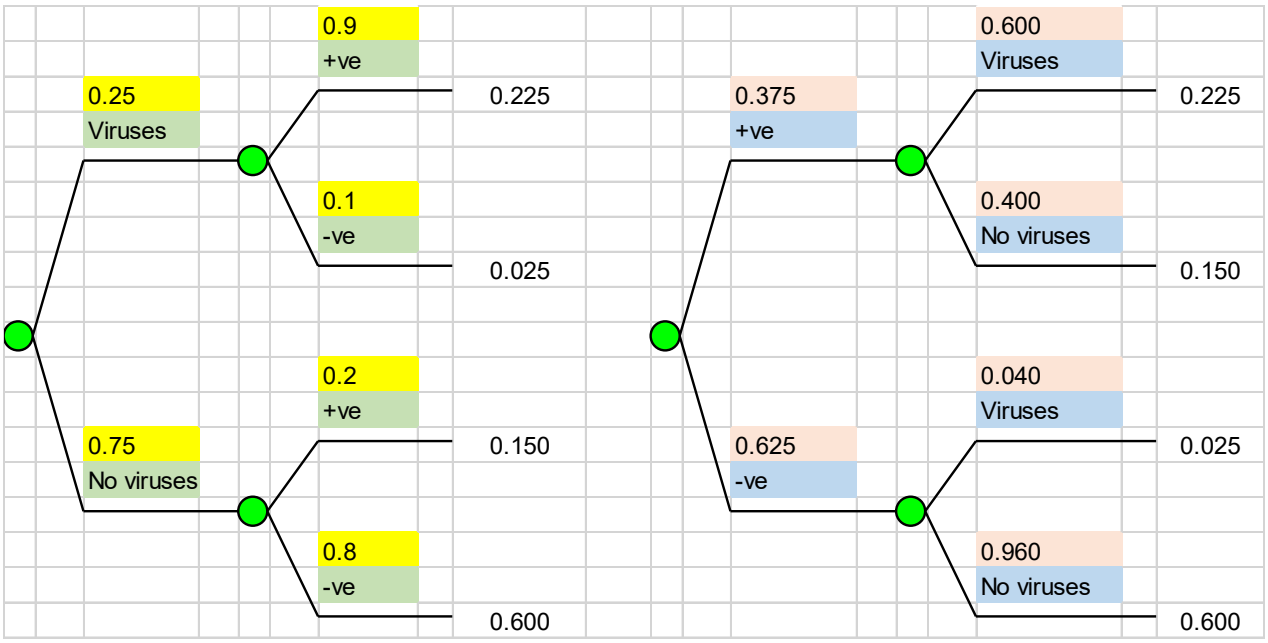
  Hence sensitivity of the test = **0.9**

- 30 of the 200 control (no disease) cases tested positive.
  False positive rate = 30/200 = 0.15

  Hence specificity of the test = 1 – 0.15 = **0.85**

Question 2.

- Flip the tree:



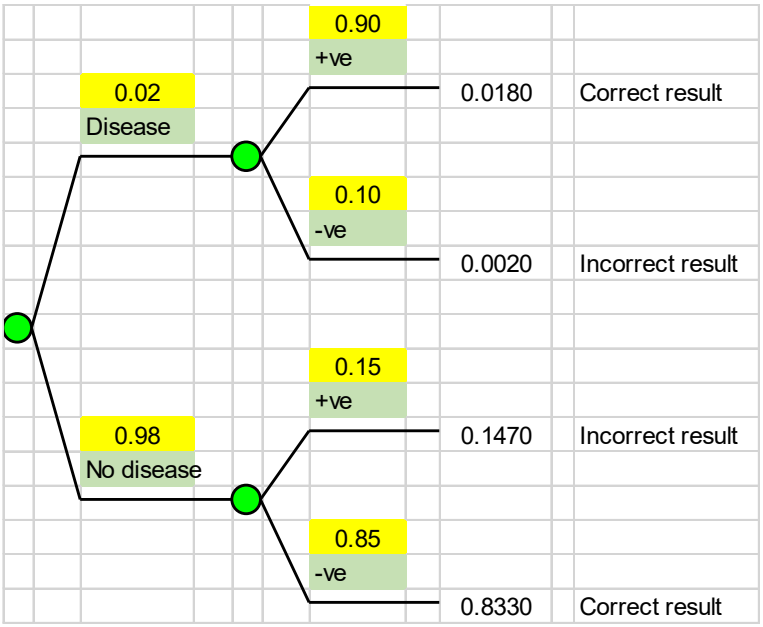
- From the flipped tree:

  (*a*) If the result is positive, probability that Mr. Tan is infected by the viruses = **0.60**

  (*b*) If the result is negative, probability that Mr. Tan is infected by the viruses = **0.04**

Question 3.

- Prevalence rate = 0.02
- Sensitivity = 0.90
- Specificity = 0.85
- Population size = 10,000



- From the probability tree, expected number of people with correct test results
  = 10,000 (0.0180 + 0.8330)
  = **8,510**