1. A crime is committed by one of two suspects, A and B. Initially, there is equal evidence against both of them. In further investigation at the crime scene, it is found that the guilty party had a blood type found in 10% of the population. Suspect A does match this blood type, whereas the blood type of Suspect B is unknown. (a) Given this new information, what is the probability that A is the guilty party? (b) Given this new information, what is the probability that B’s blood type matches that found at the crime scene?

Ans:-

Consider, the events E1, E2

and A P(E1) =1/2 , P(E2)=1/2  
P(E1/A)=20×100/100×100

P(E2/A) =20×20/100×100  
Required probability

P(A/E1) = P(E1) ×P(E1/A)/P(E1) ×P(E1/A) + P(E2) ×P(E2/A)  
=(1/2)×(20×100)/(100×100)/(1/2)×(20×100)/(100×100)+(1/2)×(20×20)/(100×100)   
=20×100/20×(100+20)

=100/120

=5/6