Solution:

p(F) = 0.5 #picking a Fair coin

p(U) = 0.5 #picking an unfair coin

p(5T) # 5 tails in a row observed

p(5T|F) = (1/2) ^5=1/32 # flipping the fair coin

p(5T|U) = 1 # flipping the unfair coin (both sides of the unfair coin are tails that's why take 1)

coins are selected at random, p(F)=p(U)=1/2

Find p(U|T) =? # find the probability that the unfair coin was chosen given that five tails in a row were observed. This is a Conditional probability.

p(5T) = p (5T | U) * p(U) + p (5T | F) * p(F)

= 1 * ½ + 1/32 * 0.5

= 0.5156

By Bayes law,

p(U|5T) = p( 5T|U)*p(U) / p(5T)

= 1*0.5/0.5156

= 0.9697

So the prob. Flipping the unfair coin given that five tails in a row were observed is approximately 0.9697 or 96%.