Let U_1 and U_2 be two urns such that U_1 contains 3 white and 2 red balls, and U_2 contains only 1 white ball. A fair coin is tossed. If head appears then 1 ball is drawn at random from U_1 and put into U_2. However, if tail appears then 2 balls are drawn at random from U_1 and put into U_2. Now 1 ball is drawn at random from U_2.

Given that the drawn ball from U_1 is white, the probability that head appeared on the coin is-

A $\frac{17}{23}$

B $\frac{11}{23}$

C $\frac{15}{23}$

D $\frac{12}{23}$

Use Baye's theorem

Required probability = P(H/W)

= [P(W|H)×P(H)]/[P(W/T). P(T) + P(W/H).P(H)]

= ½ (⅗ ×1 + ⅖ × ½)/(23/30)

= 12/23

Hence option (d) is the answer.