Question 2

Sol Probability of Black ball from first bag $P(B_1) = 6/10$

Probability of first Bag to be chose $P(I) = 1/2$

Probability of Black ball from second Bag $P(B_2) = 3/7$

Probability of second Bag to be chosen $P(II) = 1/2$

Probability of Black Ball $P(S) = 9/17$

Probability that black ball is drawn from first Bag is =

$$\frac{P(B_1) \times P(I)}{P(S)} = \frac{6/10 \times 1/2}{9/17} = \frac{17}{30}$$

$$= 0.5667$$

Question 3

Sol Probability of Truth $P(T) = 2/3$

Probability of lie $P(L) = 1 - 2/3 = 1/3$

Probability of four $P(F) = 1/6$

Probability of not four $P(N) = 1 - \frac{1}{6} = 5/6$

Probability that its actually four =

$$\frac{P(T) \times P(F)}{(P(T) \times P(F)) + (P(L) + P(N))} = \frac{2/3 \times 1/6}{\left(\frac{2}{3} \times \frac{1}{6}\right) + \left(\frac{1}{3} \times \frac{5}{6}\right)}$$

$$= \frac{1/9}{\left(\frac{2+5}{18}\right)} \Rightarrow 2/7$$