

(7) (i) Two coins are Tossed once:

Sample space (Ω) :- $\{HH, HT, TH, TT\}$

E: Tail appears on one coin.

Outcomes are: $\{HT, TH\}$.

$$P(E) = \frac{2}{4} = \frac{1}{2}$$

F: one coin shows head.

Outcomes are: $\{HT, TH\}$.

$$P(F) = \frac{2}{4} = \frac{1}{2}$$

~~E~~ $E \cap F = \{HT, TH\}$.

$$P(E \cap F) = \frac{2}{4} = \frac{1}{2}$$

$$\Rightarrow P(E|F) = \frac{P(E \cap F)}{P(F)} = \frac{1/2}{1/2} = 1$$

(ii) E: no Tail appears.

Outcomes are: $\{HH\}$.

$$P(E) = \frac{1}{4}$$

F: no head appears.

Outcomes are: $\{TT\}$.

$$P(F) = \frac{1}{4}$$

$$E \cap F = \phi$$

$$P(E \cap F) = 0$$

$$\Rightarrow P(E|F) = \frac{P(E \cap F)}{P(F)} = \frac{0}{1/4} = 0$$