1. D_1, D_2

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

$$P(6) = \frac{11}{36}$$
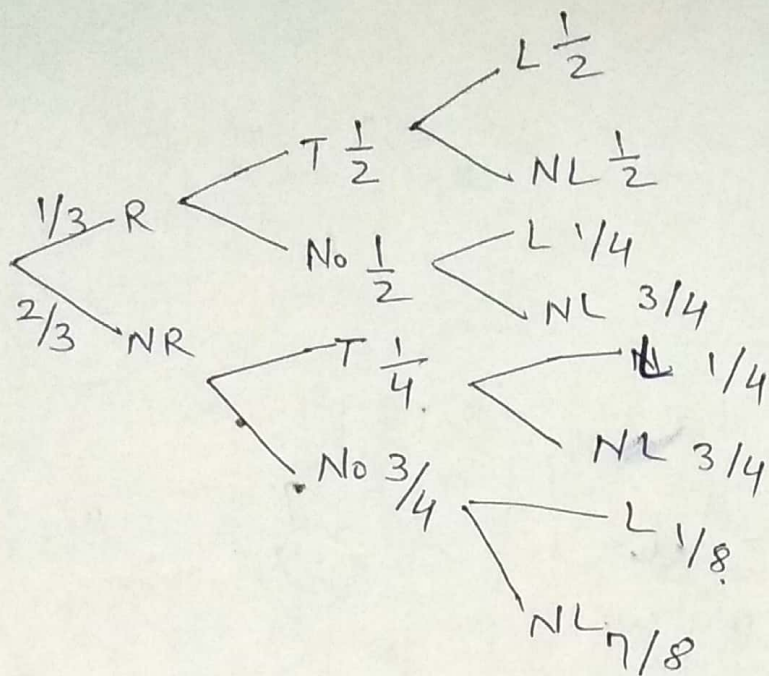
$$\boxed{P(\text{sum even} \cap 6') = \frac{5}{36}}$$

2.

$$P(\text{less than 7}) = \boxed{\frac{15}{36}}$$

3.

$$P(2H/1H) = \boxed{\frac{4}{7}}$$

H H H
H H T
H T H
T H H
T T H
T H T
H T T
T T T

4

Tree diagram:

- $\frac{1}{3}$ R
  - T $\frac{1}{2}$
    - L $\frac{1}{2}$
    - NL $\frac{1}{2}$
  - No $\frac{1}{2}$
    - L $1/4$
    - NL $3/4$
- $\frac{2}{3}$ NR
  - T $\frac{1}{4}$
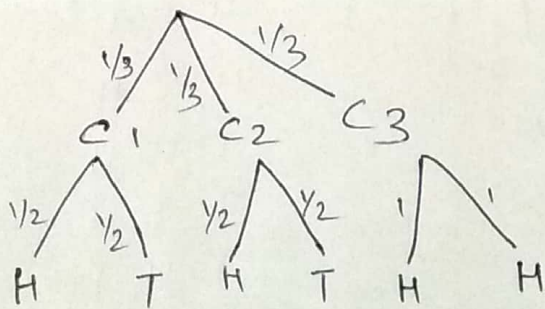   - L $1/4$
    - NL $3/4$
  - No $3/4$
    - L $1/8$
    - NL $7/8$

(a) $P(NR \cap T \cap NL) = \frac{2}{3} \times \frac{1}{4} \times \frac{3}{4} = \frac{2}{16} = \boxed{\frac{1}{8}}$

(b) $P(Late) = \frac{1}{3} \times \frac{1}{2} \times \frac{1}{2} + \frac{1}{3} \times \frac{1}{2} \times \frac{1}{4} + \frac{2}{3} \times \frac{1}{4} \times \frac{1}{4} + \frac{2}{3} \times \frac{3}{4} \times \frac{1}{8}$

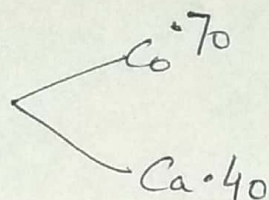$= \frac{1}{12} + \frac{1}{24} + \frac{1}{24} + \frac{1}{16}$

$= \boxed{\frac{11}{48}}$

(c) $P(R \mid L) = \dfrac{1/8}{11/48} = \boxed{6/11}$

5

Tree diagram:

- $\frac{1}{3}$ C1
  - $\frac{1}{2}$ H
  - $\frac{1}{2}$ T
- $\frac{1}{3}$ C2
  - $\frac{1}{2}$ H
  - $\frac{1}{2}$ T
- $\frac{1}{3}$ C3
  - 1 H
  - H

(a) $P(H) = 2\left(\frac{1}{3} \times \frac{1}{2}\right) + \frac{1}{3} = \frac{2}{3}$

(b) $P(B \mid H) = \dfrac{1/3}{2/3} = \boxed{\frac{1}{2}}$

$\underline{\underline{6}}$

$P(C \cap Ca) = .20$

Co .70

Ca .40

$P(C \mid Ca) = \dfrac{P(C \cap Ca)}{P(Ca)}$

$= \dfrac{.2}{.4_2} \boxed{= \dfrac{1}{2}}$

$\underline{\underline{11}}$

$P(w)\left(\dfrac{1}{9}\right)$

A
- T 5/6
  - B 8/9
  - W 1/9
- L 1/6
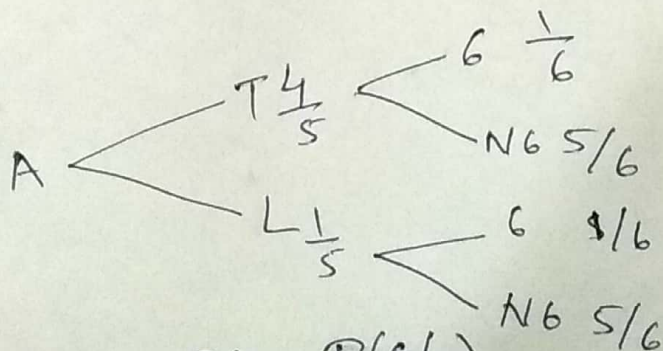 - B 8/9
  - W 1/9

$P(W) = \dfrac{1}{9}$

$P(B) = 8/9$

$P(D) = P(T \cap W) + P(L \cap B)$

$= \dfrac{5}{6} \times \dfrac{1}{9} + \dfrac{1}{6} \times \dfrac{8}{9}$

$= \dfrac{8}{6 \times 9} = \dfrac{1}{9}$

$P(T/W) = \dfrac{5/(6 \times 9)}{1/9} = \dfrac{5}{6 \times 9} \times 9$

$\boxed{= 5/6}$

$\underline{\underline{12}}$

A
- T 4/5
  - 6 1/6
  - N6 5/6
- L 1/5
  - 6 1/6
  - N6 5/6

$P(T/6) = \dfrac{P(T) \cdot P(6/T)}{P(T) \cdot P(6/T) + P(L) \cdot P(6/L)}$

$= \dfrac{\dfrac{4}{5} \times \dfrac{1}{6}}{\dfrac{4}{5} \times \dfrac{1}{6} + \dfrac{1}{5} \times \dfrac{1}{6}}$

$\boxed{= \dfrac{4}{5}}$