Problem 1

(a). $\Omega = \{G, B, GB, BG, GG, BB,$
$GBB, GBG, GGB, GGG,$
$BGG, BGB, BBG, BBB\}$

Pr of each outcome $= \frac{1}{14}$

(b). B, BG, BB, BGG, BGB, BBG, BBB $\Rightarrow 7$

$\therefore Pr(A) = \frac{7}{14} = \frac{1}{2}$

G, GBB, BGB, BBG, GB, BG $\Rightarrow 6$

$\therefore Pr(B) = \frac{6}{14} = \frac{3}{7}$

GB, BG, GBB, GBG, GGB, BGG, BGB, BBG $\Rightarrow 8$

$\therefore Pr(C) = \frac{8}{14} = \frac{4}{7}$

Problem 2

$5+4 = 9$ characters $\because 9$ characters and 4 digit places

$\therefore \binom{9}{4}$ $\because$ number $= 10^4$ digit $= 26^5$

$\therefore Pr(\text{letter come before}) = \frac{10^4(26^5)}{\binom{9}{4}(10^4)(26^5)} = \frac{1}{\binom{9}{4}} = \frac{1}{126}$.

Problem 3

(a). $(\frac{1}{4})^n$

(b). $(\frac{3}{4})^n$

(c). $1-(\frac{1}{4})^n$

(d). $1-(\frac{3}{4})^n$

Problem 4

(a). $A \cap B \cap \bar{C}$

(b). $(\bar{B} \cap C) \cup (B \cap \bar{C})$

(c). $\bar{A} \cap \bar{B} \cap \bar{C}$

(d). $A \cup B \cup C$

(e). $A \cap B \cap C$

(f). $(A \cap \bar{B} \cap \bar{C}) \cup (\bar{A} \cap B \cap \bar{C}) \cup (\bar{A} \cap \bar{B} \cap C)$

Problem 5

(a). $\Omega = \{(P,P), (P,S), (P,t),$
$(S,P)\ (S,S), (S,t)$
$(t,P), (t,S), (t,t)\}$.

(b). Alice get P

$Pr((t,P),(S,P),(P,P)) = 0.5$

Bob get P

$Pr((P,t),(P,S),(P,P)) = 0.2$

$0.2 + 0.5 = Pr((t,P)(S,P)(P,P)$
$(P,t)(P,S),(P,P))$

at least 1 get P, but none gets S.

$Pr((P,t),(P,P),(t,P)) = 0.3$

$\therefore Pr((P,S),(P,P),(S,P)) = 0.2 + 0.5 - 0.3 = 0.4.$