1. For arbitrary events A and B, we have $P(A-B) = ($ $\quad$ $)$.

(A) $P(A)-P(B)$. (B) $P(A)-P(B)+P(AB)$. (C) $P(A)-P(AB)$. (D) $P(A)+P(B)-P(AB)$.

2. Given $0<P(A)<1$, $0<P(B)<1$, $P(A|B)+P(\bar{A}|\bar{B})=1$, which of the following is correct? ( )

(A) Events A and B are mutually exclusive.

(B) Events A and B are complimentary.

(C) Events A and B are not independent.

(D) Events A and B are independent.

3. For events A and B satisfy $P(AB) = 0$, which of the following is correct? ( )

(A) Events A and B are mutually exclusive.

(B) Events A and B are independent.

(C) $P(A) = 0$ or $P(B) = 0$.

(D) $P(A-B) = P(A)$.

4. For events A and B satisfy $P(B|A) = 1$, which of the following is correct? ( )

(A) Event A is a certain event. (B) $P(A-B) = 0$. (C) $A \subset B$. (D) $B \subset A$.

5. Given events A and B with $AB = \emptyset$, $A \neq \emptyset$ and $B \neq \emptyset$, which one of the following is correct? ( )

(A) $P(AB) = P(A)P(B)$

(B) $P(A \cup B) = P(A) + P(B)$

(C) $P(A-B) = P(A) - P(B)$

(D) None of the above.

6. Given random events A and B with $P(A) = 0.7, P(A-B) = 0.3$, find $P(\overline{AB}) =$________.

7. Given $P(A) = 0.4, P(A \cup B) = 0.7$,

(1) if A and B are mutually exclusive event, then $P(B) =$____________;

(2) if A and B are independent, then $P(B) =$_______________.

8. In a city, 30 percent of the people are Conservatives (保守派), 50 percent are Liberals (自由派), and 20 percent are Independents (独立人士). Records show that in a particular election, 65 percent of the Conservatives voted, 82 percent of the Liberals voted, and 50 percent of the Independents voted. If a person in the city is selected at random and it is learned that she did not vote in the last election, what is the probability that she is a Liberal? **Hint**: use the Bayes rule.

9. Given $P(A) = 1/3$ and $P(B) = 1/2$, find the following probabilities

(1) $P(\bar{A}B)$, $P(\bar{A}\bar{B})$, $P(\bar{A} \cup B)$ under the condition that A and B are mutually exclusive.

(2) $P(A \cup B)$, $P(A - B)$ under the condition that A and B are independent.

(3) $P(A\bar{B})$, $P(\bar{A}B)$ under the condition that $A \subset B$.

10. A bag filled with m $(m > 3)$ white balls and n black balls. We are told that a ball is missing but its color is unknown. We randomly draw two balls from the bag. It turns out that both balls are white. Find the probability of the missing ball is white. **Hint**: use the Bayes rule.