

..... 实 验 报 告 实 验 日 期 年 月 日

..... 系 专业 21¹⁴ 年级 学生 庄任强 组别

△3.3

4. 记 $A = \{\text{抽到产品是次品}\}$

$X_i = \{\text{产品来自 } i \text{ 车间}\} (i \text{ 可为 } A, B, C)$

$$P(X_A) = 0.25 \quad P(X_B) = 0.35 \quad P(X_C) = 0.4$$

$$P(A|X_A) = 5\% \quad P(A|X_B) = 4\% \quad P(A|X_C) = 2\%$$

$$P(A) = P(X_A)P(A|X_A) + P(X_B)P(A|X_B) + P(X_C)P(A|X_C)$$

$$= 3.45\%$$

$$P(X_A|A) = \frac{P(X_A)P(A|X_A)}{P(A)} = \frac{25}{69}$$

$$P(X_B|A) = \frac{P(X_B)P(A|X_B)}{P(A)} = \frac{28}{69}$$

$$P(X_C|A) = \frac{P(X_C)P(A|X_C)}{P(A)} = \frac{16}{69}$$

5. 记 $A = \{\text{收到信号为 } 0\}$ $B_i = \{\text{发出信号为 } i\} (i=0,1)$

$$P(B_0) = 0.6 \quad P(B_1) = 0.4$$

$$P(A|B_0) = 0.8 \quad P(A|B_1) = 0.1$$

$$P(A) = \sum_{i=0}^1 P(B_i)P(A|B_i) = 0.52$$

$$P(B_0|A) = \frac{P(B_0)P(A|B_0)}{P(A)} = \frac{12}{13}$$

△3.4

3. $\because A, B$ 相互独立.

$$P(A \cup B) = 1 - P(\overline{A \cup B}) = 1 - P(\overline{A} \overline{B}) = 1 - P(\overline{A})P(\overline{B})$$

$$= 1 - (1-p)(1-q)$$

$$= p + q - pq$$

$$P(A \cup \overline{B}) = 1 - P(\overline{A \cup \overline{B}}) = 1 - P(\overline{A} B) = 1 - P(\overline{A})P(B)$$

$$= 1 - (1-p)q$$

$$P(\overline{A} \cup \overline{B}) = 1 - P(\overline{\overline{A} \cup \overline{B}}) = 1 - P(A \cap B) = 1 - P(A)P(B)$$

$$= 1 - pq$$

$$4. P(\overline{A} \overline{B}) = P(\overline{A})P(\overline{B}) = \frac{1}{9}$$

$$P(\overline{A} B) = P(\overline{A})P(B)$$

$$= P(\overline{A})P(B) = P(\overline{A})P(B) = 0$$

$$\therefore P(B) = P(B)$$

$$\therefore P(B) = \frac{1}{2} = P(B)$$

$$\therefore P(\overline{B}) = \frac{2}{3} \quad P(A) = \frac{2}{3}$$

△3.5.

4. 记 $A_k = \{\text{有 } k \text{ 台电梯运行}\} (k=0,1,\dots,4)$

$$(1) P(A_{k \geq 1}) = 1 - C_4^0 \left(\frac{3}{4}\right)^4 \left(\frac{1}{4}\right)^0 = \frac{25}{256}$$

$$(2) P(A_2) = 1 - C_4^1 \left(\frac{3}{4}\right)^3 \left(\frac{1}{4}\right)^1 = \frac{21}{256}$$

$$(3) P(A_4) = 1 - C_4^3 \left(\frac{3}{4}\right)^3 \left(\frac{1}{4}\right)^0 = \frac{81}{256}$$

5. 记 $A_i = \{\text{第 } i \text{ 次抽到次品}\} (i=0,1,\dots,3)$

$$P(A_{i \geq 1}) = 1 - P(A_0)$$

$$= 1 - C_3^0 p^0 (1-p)^3 = \frac{19}{27}$$

$$p = \frac{2}{3}$$

5. 记 $A = \{\text{1号译出}\}$ $B = \{\text{2号译出}\}$

$$P(A \cup B) = 1 - P(\overline{A \cup B})$$

$$= 1 - P(\overline{A})P(\overline{B}) = 0.7075$$