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$= P(AB \cup A\bar{B})$

14. 解: (1) $P(A) = P(AB) + P(A\bar{B}) = 20\%$ $\qquad$ $P(B) = P(AB \cup \bar{A}B) = P(AB) + P(\bar{A}B)$
$$= 80\%$$ □

(2) $P(B|A) = \dfrac{P(BA)}{P(A)} = \dfrac{5\%}{20\%} = 25\%$ □

(3) $P(B|\bar{A}) = \dfrac{P(B\bar{A})}{P(A)} = \dfrac{10\%}{1-20\%} = 12.5\%$ □

(4) $P(A|\bar{B}) = \dfrac{P(A\bar{B})}{P(\bar{B})} = \dfrac{15\%}{1-80\%} = 75\%$ □

(5) $P(A|B) = \dfrac{P(AB)}{P(B)} = \dfrac{5\%}{80\%} = \dfrac{1}{16}$ □

19. 解: 设"任选一名射手是 i 级射手"这一事件为 A_i, "该射手进入决赛"这一事件为 B。

$A_1 \cup A_2 \cup A_3 = \Omega$ 且 A_1, A_2, A_3 互不相容

记小组中任选一名射手进入决赛这一事件为 C

则 $P(C) = P(B|A_1)P(A_1) + P(B|A_2)P(A_2) + P(B|A_3)P(A_3)$
$$= 0.7^3$$ □

23. 解: 记"箱中有 i 件正品"这一事件为 A_i, "取出的一件是正品"这一事件为 B

$A_0 \cup A_1 \cup A_2 \cup A_3 \cup A_4 = \Omega$ 且 $A_0, \cdots A_4$ 互不相容

(1) $P(B) = \sum_{i=0}^{4} P(B|A_i)P(A_i) = \dfrac{1}{5}\left(0 + \dfrac{1}{4} + \dfrac{2}{4} + \dfrac{3}{4} + \dfrac{4}{4}\right) = \dfrac{1}{2}$ □

(2) "这一箱里没有次品"这一事件为 C. $\qquad$ $P(C) = \dfrac{1}{5}$

$P(C) = P(C|B)P(B)$. $\Rightarrow$ $P(C|B) = \dfrac{P(C)}{P(B)} = \dfrac{1/5}{1/2} = \dfrac{2}{5}$. □

25. 解：(1) 记该事件为A. $P(A) = C_5^2 \cdot 0.46^2 \cdot$ ~~⬛~~ $0.40 \cdot 0.11 \cdot 0.03 = $ ~~0.0176~~ 0.00279

(2) 记该事件为B. $P(B) = C_5^3 \cdot 0.46^3 \cdot$ ~~⬛~~ $0.40^2 = 1.557376$

(3) 记该事件为C $P(C) = (1-0.03)^5 = 0.85873$

补充题1. 解：$P(AC \mid ABUC) = \dfrac{P(AC(ABUC))}{P(ABUC)} = \dfrac{P(AC)}{P(AB)+P(C)-P(ABC)}$ （∵ $BC = \phi$. ∴ $P(ABC) = 0$）

$= \dfrac{P(A)P(C)}{P(A)P(B)+P(C)} = \dfrac{1}{4}$ ~~⬛⬛⬛~~ （∵ A与B. A与C 相互独立）

$\Rightarrow \dfrac{1}{2}P(C) = \dfrac{1}{4}\left(\dfrac{1}{4}+P(C)\right) \Rightarrow P(C) = \dfrac{1}{4}$

补充题2. 解：(1) 记"感染3×病"为A. "血液检查为阳性"为B. 所求即 $P(A\mid B)$.

$P(B) = P(\overline{A}\mid B)P(B) + P(A\mid B)P(B) = P(B\mid\overline{A})P(\overline{A}) + P(B\mid A)P(A)$
（$= P(\overline{A}B) + P(AB)$）

$= 0.01 \cdot \dfrac{999}{1000} + 0.99 \cdot \dfrac{1}{1000} = 0.01098$

$P(A\mid B) = \dfrac{P(AB)}{P(B)} = \dfrac{P(B\mid A)P(A)}{P(B)} = \dfrac{0.99 \cdot 1/1000}{0.1098} = 0.09016$

(2) 此时记"感染3×病"为 A_2. "尿液检查呈阳性"为C. 所求即 $P(A_2\mid C)$

由(1)知 $P(A_2) = P(A\mid B) = 0.09016$

$P(A_2\mid C) = \dfrac{P(C\mid A_2)P(A_2)}{P(C\mid A_2)P(A_2)+P(\overline{C}\mid\overline{A_2})P(\overline{A_2})} = \dfrac{0.085652}{0.131144} = 0.65311$

(3) 记此时"感染3×病"为 A′. "血液检查为阳性"为B, ~~⬛~~ $A_1' = A\mid B$,
"尿液检查呈阳性"为C.

$P(A_1') = P(A'\mid B) = \dfrac{P(B\mid A')P(A')}{P(B\mid A')P(A')+P(B\mid\overline{A'})P(\overline{A'})} = 0.5$

$P(A_1'\mid C) = \dfrac{P(C\mid A_1')P(A_1')}{P(C\mid A_1')P(A_1')+P(C\mid\overline{A_1'})P(\overline{A_1'})} = 0.95$