(6) (a) $P(I|C) = \frac{P(I,C)}{P(C)} = \frac{P(I,E,C) + P(I,E',C)}{P(C)}$

$= \frac{P(I|E,C) * P(E,C) + P(I|E',C) * P(E',C)}{P(C)}$

$= \frac{(0.8)(P(E,C,B) + P(E,C,B')) + 0.7((P(E',C,B) + P(E',C,B'))}{P(C)}$

$= \frac{(0.8)(P(E|C,B) \cdot P(C,B) + P(E'|C,B') \cdot P(C,B')) + (0.7)(P(E'|C,B) \cdot P(C,B) + P(E'|C,B') \cdot P(C,B'))}{P(C)}$

$P(C,B) = P(C,B,A) + P(C,B,A')$

$= P(B|A,C) \cdot P(A,C) + P(B|A',C) \cdot P(A',C)$

$= (0.4)(0.05) + (0.9)(0.45)$

$= 0.425.$

$P(C,B') = P(B'|A,C) \cdot P(A,C) + P(B'|A',C) \cdot P(A',C)$

$= (0.6)(0.05) + (0.1)(0.45)$

$= 0.075.$

$P(I|C) = \frac{0.8(0.1 \times 0.425 + 0.2 \times 0.075) + 0.7(0.9 \times 0.425 + 0.8 \times 0.075)}{0.5}$

$= \frac{0.046 + 0.30975}{0.5}$

$= \underline{\underline{0.4115}}$

(b) $P(E|\sim D) = \dfrac{P(E,D')}{P(D')}$

$P(ED') = P(EBD') + P(EB'D')$

$= P(E|B)\,P(BD') + P(E|B')\,P(B'D')$

$= (0.1)\,P(B,D') + (0.2)\,P(B',D')$

$= (0.1)\,(P(BAD' + P(BD'A')) + 0.2\,(P(B'AD') + P(B'A'D'))$

$= (0.1)\,(P(B|A)\,P(AD') + P(B|A')\,P(A'D'))$

$+ 0.2\,(P(B'|A)\,P(AD') + P(B'|A')\,P(A'D'))$

$P(AD') = P(AD'C) + P(AD'C')$

$= P(D'|C)\,P(AC) + P(D'|C')\,P(AC')$

$= 0.7 \times 0.05 + 0.4 \times 0.05$

$= \underline{0.055}$

$P(A'D') = P(A'D'C) + P(A'D'C')$

$= P(D'|C)\,P(A'C) + P(D'|C')\,P(A'C')$

$= 0.7 \times 0.45 + 0.4 \times 0.45$

$= \underline{0.495}$

$P(E,D') = 0.1 \times (0.4 \times 0.055 + 0.9 \times 0.495) +$

$0.2\,(0.6 * 0.055 + 0.1 \times 0.495)$

$= 0.06325$

$P(D') = P(D'C) + P(D'C') = P(D'|C)\,P(C) + P(D'|C')\,P(C')$

$= 0.7 \times 0.5 + 0.4 \times 0.5 = \underline{0.55}$

$P(E|\sim D) = \dfrac{P(ED')}{P(D')} = \dfrac{0.06325}{0.55} = \underline{0.115}$

(c)

$$P(G|B, \sim D) = \frac{P(GBD')}{P(BD')}$$

$$P(GBD') = P(GFBD') + P(GF'BD')$$

$$= P(G|F)\,P(FBD') + P(G|F')\,P(F'BD')$$

$$= 0.9\,(P(F|BD') \cdot P(BD') + 0.1\,(P(F'|BD') \cdot P(BD'))$$

$$= 0.9\,(0.4 \times P(BD')) + 0.1\,(0.6 \times P(BD'))$$

$$P(BD') = P(BD'A) + P(BD'A')$$

$$= P(B|A)\,P(D'A) + P(B|A')\,P(D'A')$$

$$= 0.4 \times P(D'A) + 0.9 \times P(D'A')$$

$$= 0.4\,(P(D'|C)\,P(AC) + P(D'|C')\,P(AC'))$$

$$+ 0.9\,(P(D'|C)\,P(A'C) + P(D'|C')\,P(A'C'))$$

$$= 0.4 \times 0.055 + 0.9 \times 0.495$$

$$= 0.4695$$

$$P(G|B, \sim D) = \frac{0.9\,(0.4 \times 0.4675) + 0.1\,(0.6 \times 0.4675)}{0.4675}$$

$$= \frac{0.1683 + 0.02805}{0.4675} = \frac{0.19635}{0.4675}$$

$$= \underline{0.42}$$