# Part I

1 Bishop Exercise 8.11

$$P(F=0 \mid D=0) = \frac{P(D=0 \mid F=0)\, P(F=0)}{P(D=0)}$$

$$\downarrow$$

$$p(D=0 \mid F=0) = \sum_{B,G} P(D=0 \mid G)\, p(G \mid B, F=0)\, p(B) = 0.748$$

$$p(D=0) = \sum_{B,G,F} p(D=0 \mid G)\, p(G \mid B, F)\, p(B)\, p(F) = 0.352$$

$$p(F=0) = 0.1$$

$$p(F=0 \mid D=0) = \frac{(0.748)(0.1)}{(0.352)} = 0.213$$

$$p(F=0 \mid D=0, B=0) = 0.110$$

2

$y_{adz} = J$ $\quad J=1 = 0.30$ $\quad J=0 = 0.70$

Films: W, B, C, R

a) $P(J=1 \mid W=1, B=0, C=0, R=1)$

$= (0.3)(0.8)(0.50)(0.30)(0.50)$

$= 0.018$

b) $P(J=1 \mid W=1, B=1, C=0, R=1)$

$= (0.3)(0.8)(0.70)(0.50)$

$= 0.084$