1.1

1. $P[GH] = 0.95 \rightarrow P[\neg GH] = 0.05$

$P[SI|GH] = 0.02$

$P[SI|\neg GH] = 0.3$

$P[SI] = P[SI|GH]P[GH] + P[SI|\neg GH]P[\neg GH]$

$= 0.02 \times 0.95 + 0.3 \times 0.05$

$= 0.034$

$$P[GH|SI] = \frac{P[SI|GH]P[GH]}{P[SI]}$$

$$= \frac{0.02 \times 0.95}{0.034}$$

$= 0.56$

2. $P[SIT|GH] = P[SI|GH]^2 = 0.02^2 = 0.0004$

$P[SIT|\neg GH] = P[SI|\neg GH]^2 = 0.3^2 = 0.09$

$P[GH] = 0.95$

$P[SIT] = P[SIT|GH]P[GH] + P[SIT|\neg GH]P[\neg GH]$

$= 0.0004 \times 0.95 + 0.09 \times 0.05$

$= 0.00488$

$$P[GH|SIT] = \frac{P[SIT|GH]P[GH]}{P[SIT]}$$

$$= \frac{0.0004 \times 0.95}{0.00488} = 0.078$$