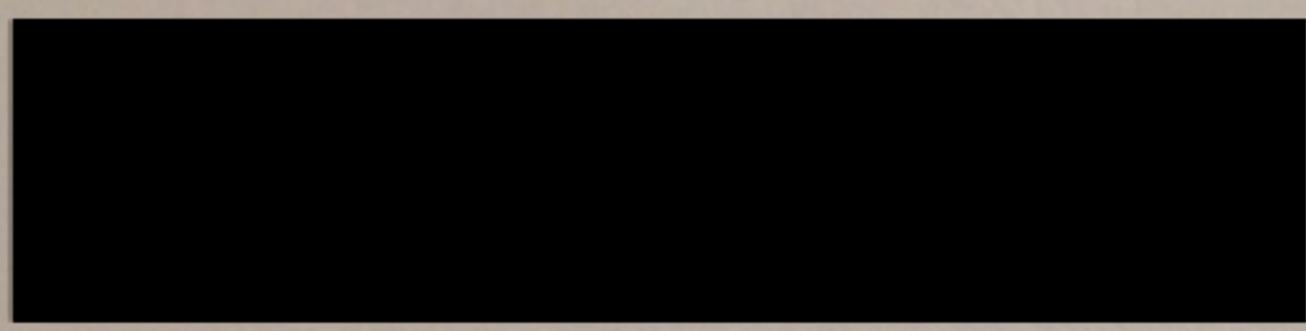
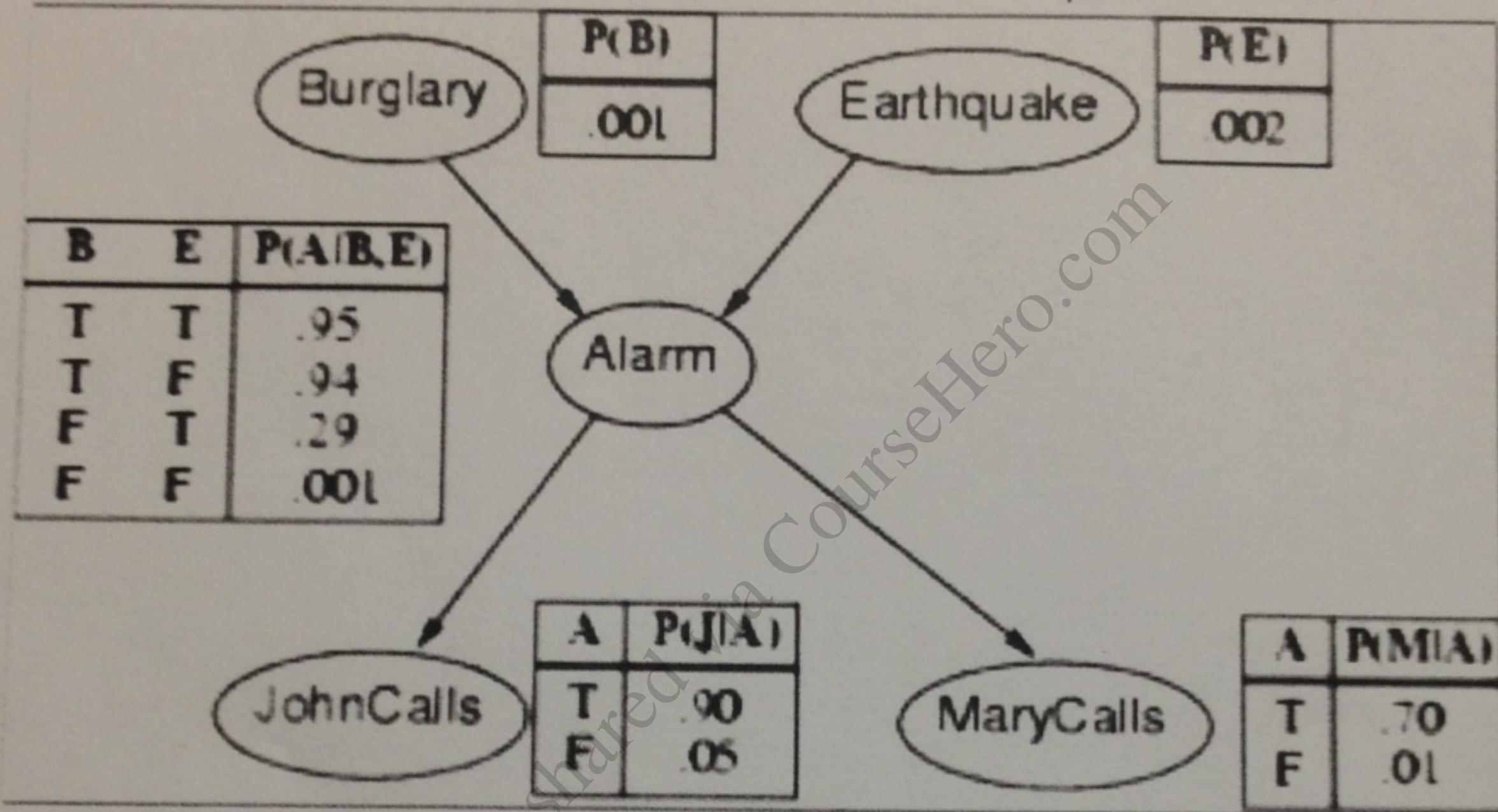


(C)



Given the Belief network for the alarm problem, answer the questions below:



1) (5pts) Calculate the probability of  $P(j, m, a, \neg b, \neg e)$

$$P(j|A) \times P(m|A) \times P(a|\neg B, \neg E) \times P(\neg B) \times P(\neg E)$$

$$= 0.9 \times 0.7 \times 0.001 \times 0.999 \times 0.998$$

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2) (5pts) Calculate the probability of  $P(j, m, a, b, \neg e)$

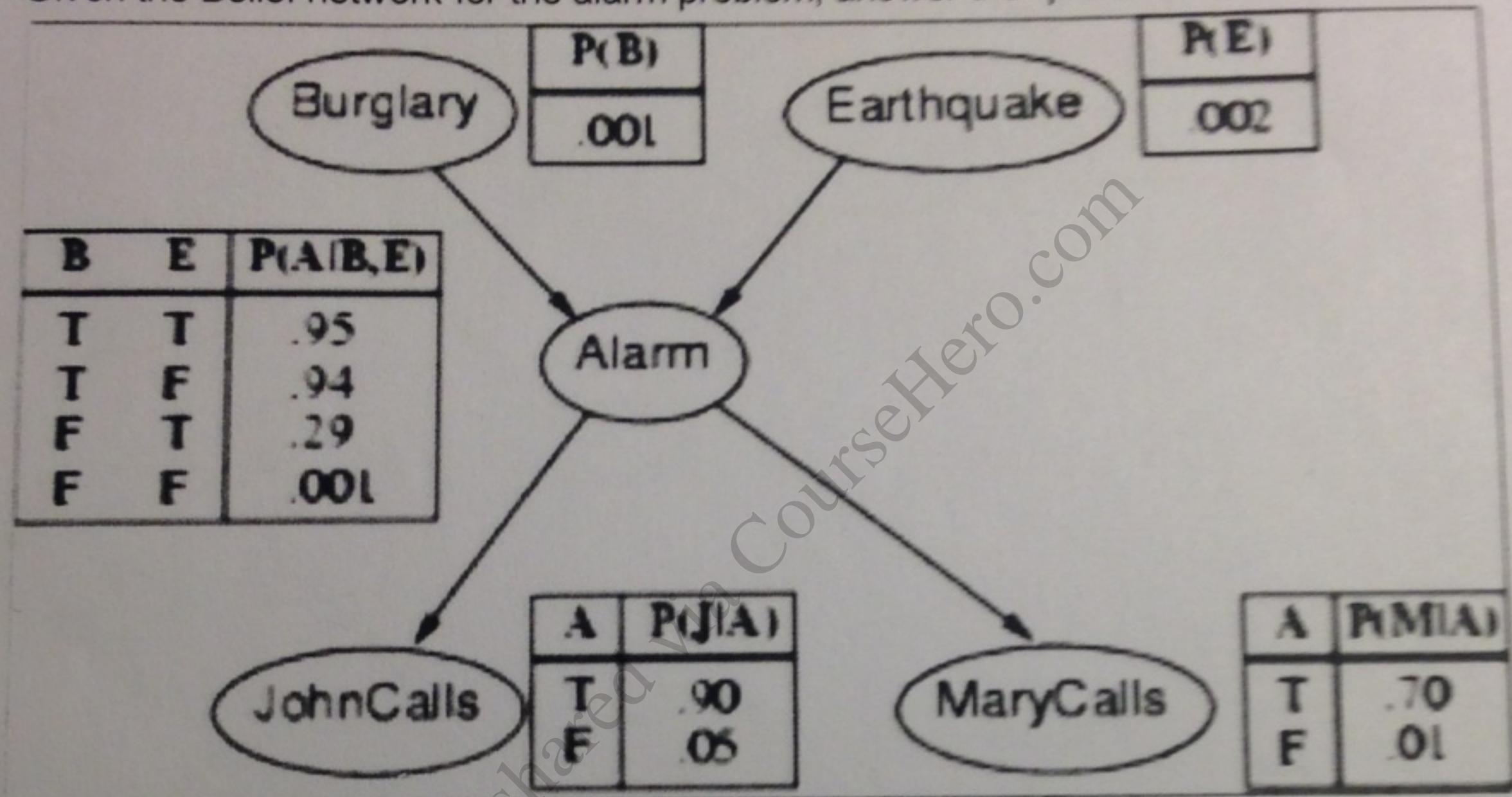
$$P(j|A) \times P(m|A) \times P(a|B, \neg E) \times P(B) \times P(\neg E)$$

$$= 0.9 \times 0.7 \times 0.94 \times 0.001 \times 0.998$$

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Wednesday, November 6, 2013  
 CS561 Artificial Intelligence  
 Quiz 9

Given the Belief network for the alarm problem, answer the questions below:



1) (5pts) Calculate the probability of  $P(j, m, a, \neg b, \neg e)$

$$\begin{aligned}
 & P(j, m, a, \neg b, \neg e) \\
 &= P(j|a) P(m|a) P(a|\neg b, \neg e) \cdot P(\neg b) \cdot P(\neg e) \\
 &= 0.9 \times 0.7 \times 0.001 \times 0.999 \times 0.998 \\
 &= 6.2 \times 10^{-6}
 \end{aligned}$$

2) (5pts) Calculate the probability of  $P(j, m, \neg a, b, e)$

$$\begin{aligned}
 & P(j, m, \neg a, b, e) \\
 &= P(j|\neg a) \cdot P(m|\neg a) \cdot P(\neg a|b, e) \cdot P(b) \cdot P(e) \\
 &= 0.05 \times 0.01 \times (1 - 0.95) \times 0.001 \times 0.002 \\
 &= 0.05 \times 0.01 \times 0.05 \times 0.001 \times 0.002 \\
 &= 5 \times 10^{-11}
 \end{aligned}$$

Name: [REDACTED]  
Student ID: [REDACTED]  
Student email: [REDACTED]

Thursday, November 7, 2013  
CS561 Artificial Intelligence  
Quiz 9

Given the Belief network for the alarm problem, answer the questions below.



1) (5pts) Calculate the probability of  $P(j, m; a, \neg b, \neg e)$

$$\begin{aligned} &= P(j|\alpha) \times P(m|\alpha) \times P(a|b, \neg e) \times P(\neg b) \times P(\neg e) \\ &= 0.90 \times 0.30 \times 0.001 \times 0.999 \times 0.998 \end{aligned}$$

2) (5pts) Calculate the probability of  $P(j, \neg m; a, b, \neg e)$

$$\begin{aligned} &= P(j|\alpha) \times P(\neg m|\alpha) \times P(a|b, \neg e) \times P(b) \times P(\neg e) \\ &= 0.90 \times 0.30 \times 0.94 \times 0.001 \times 0.998 \end{aligned}$$