

**True/False** - No explanation needed. (For each: 1 point if correct, 0 points if not answered, -1 points if incorrect)

1. Assuming that  $P(A), P(B) > 0$ , then

$$P(A|B) = P(B|A) \text{ implies } P(A) = P(B)$$

True/False

2. Assume  $E$  is an event from a sample space  $S$ , and  $F_1, \dots, F_n$  are mutually exclusive events such that  $\bigcup_{i=1}^n F_i = S$ . Moreover  $P(E) > 0$  and  $P(F_i) > 0$  for  $i = 1, 2, \dots, n$ . Then

$$P(F_j|E) = \frac{P(E|F_j)P(F_j)}{\sum_{i=1}^n P(E|F_i)P(F_i)}$$

True/False

**Problems** - Needs justification.

1. 4/5 of mail sent to an email address is personal and 1/5 is spam. When a personal email is sent, the probability it is blocked by the address' spam filter is 5%. When spam is sent, the probability it is blocked is 90%. What is the probability that a message that is blocked by the spam filter is personal? Write as a fraction in lowest terms. (10 points)