Q1 $c(son) = 3$ $c(love) = 2$ $c(marriage) = 3$ $c(bliss) = 3$

$c(sweet) = 3$ $c(dagger) = 3$ $c(husband) = 3$

$c(jealous) = 4$ ~~$c(tears) =$~~ $c(scumble) = 3$

$|V| = 9$ $c(tragedy) = 14$ $c(comedy) = 13$

~~$P(bliss) =$~~

$P(bliss \mid tragedy) = \dfrac{1 + 0.1}{14 + 0.1 \times 9} = 0.074$ $P(bliss \mid comedy) = \dfrac{2 + 0.1}{13 + 0.1 \times 9} = 0.15$

$P(son \mid tragedy) = \dfrac{2 + 0.1}{14 + 0.1 \times 9} = 0.141$ $P(son \mid comedy) = \dfrac{1 + 0.1}{13 + 0.1 \times 9} = 0.079$

$P(scumble \mid tragedy) = \dfrac{1 + 0.1}{14 + 0.1 \times 9} = 0.074$ $P(scumble \mid comedy) = \dfrac{2 + 0.1}{13 + 0.1 \times 9} = 0.151$

$P(marriage \mid tragedy) = \dfrac{1 + 0.1}{14 + 0.1 \times 9} = 0.074$ $P(marriage \mid comedy) = \dfrac{2 + 0.1}{13 + 0.1 \times 9} = 0.15$

$P(tragedy \mid D) = \dfrac{P(D \mid tragedy) \cdot P(tragedy)}{P(D)} \approx P(D \mid tragedy) \cdot P(tragedy)$ —①

Similarly
$P(comedy \mid D) = P(D \mid comedy) \cdot P(comedy)$

$P(tragedy \mid D) = \dfrac{3}{6} \times 0.074 \times 0.141 \times 0.074 \times 0.074 = 2.114 e^{-6}$

$P(comedy \mid D) = \dfrac{3}{6} \times 0.151 \times 0.079 \times 0.151 \times 0.151 = 0.00013$

Document D will belong to class <u>comedy</u>.