

Q1.

(a)	1	2	3	4	5	6
$P(X = i)$	$1/4$	$1/4$	$1/8$	$1/8$	$1/8$	$1/8$

(b)	1	2	3	4	5	6
$P(X = i)$	$1/4$	$1/4$	$5/18$	$5/18$	$5/18$	$1/3$

Q2.

$$|C| * |V| * |V|!$$

Q3.

NB models rely on joint probabilities in training while MaxEnt models rely on conditional probabilities during training and testing (?), such that NB assumes conditional independence of feature given class. And the purpose of training differs in a way that NB has pre-determined weights to calculate the joint probabilities, while MaxEnt models estimate the value of weights ( $\lambda$ ) during training. What is done in NB training will be done in the testing stage of MaxEnt, which is to calculate the conditional probabilities.